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FIG. 1

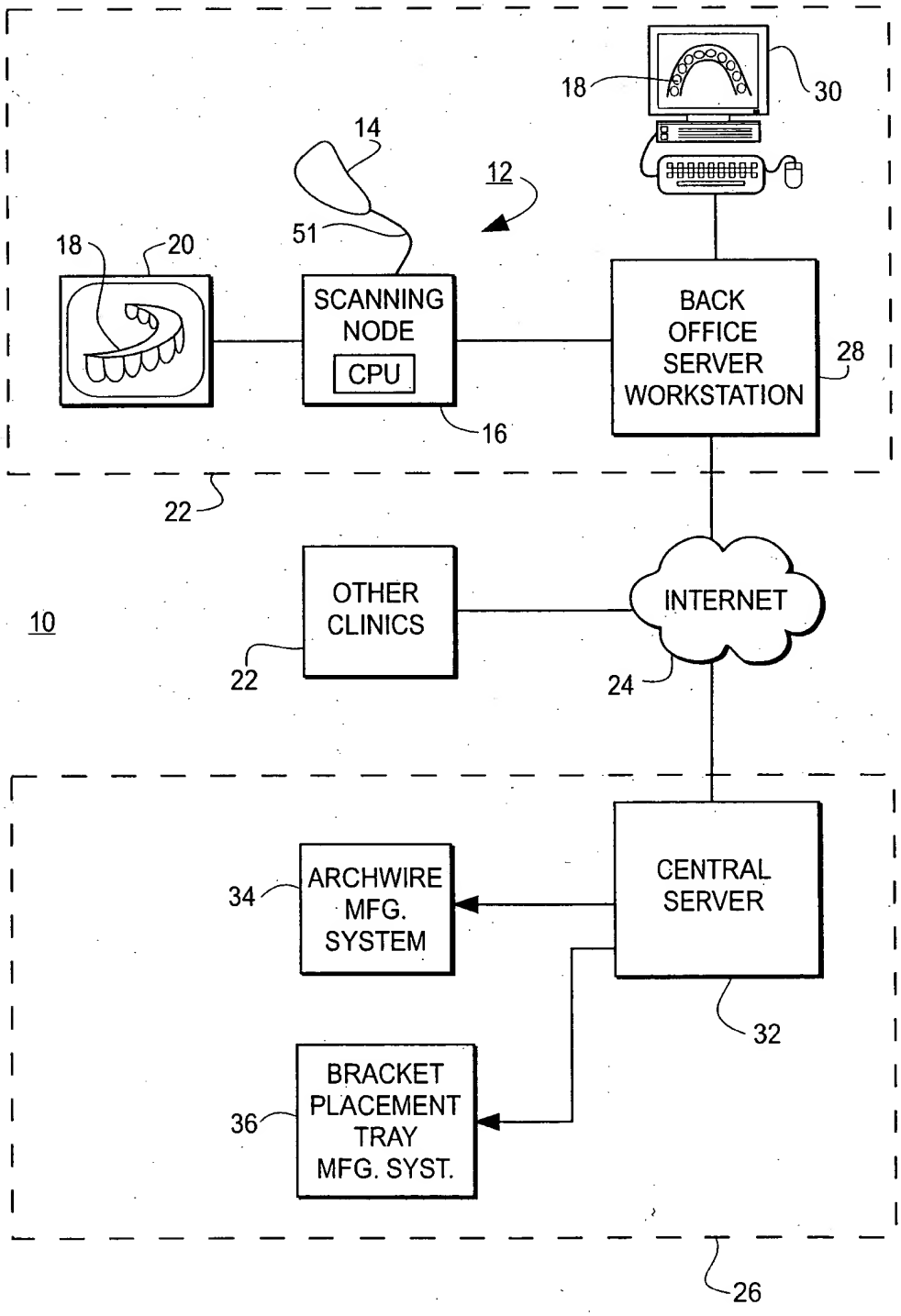

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FIG. 2

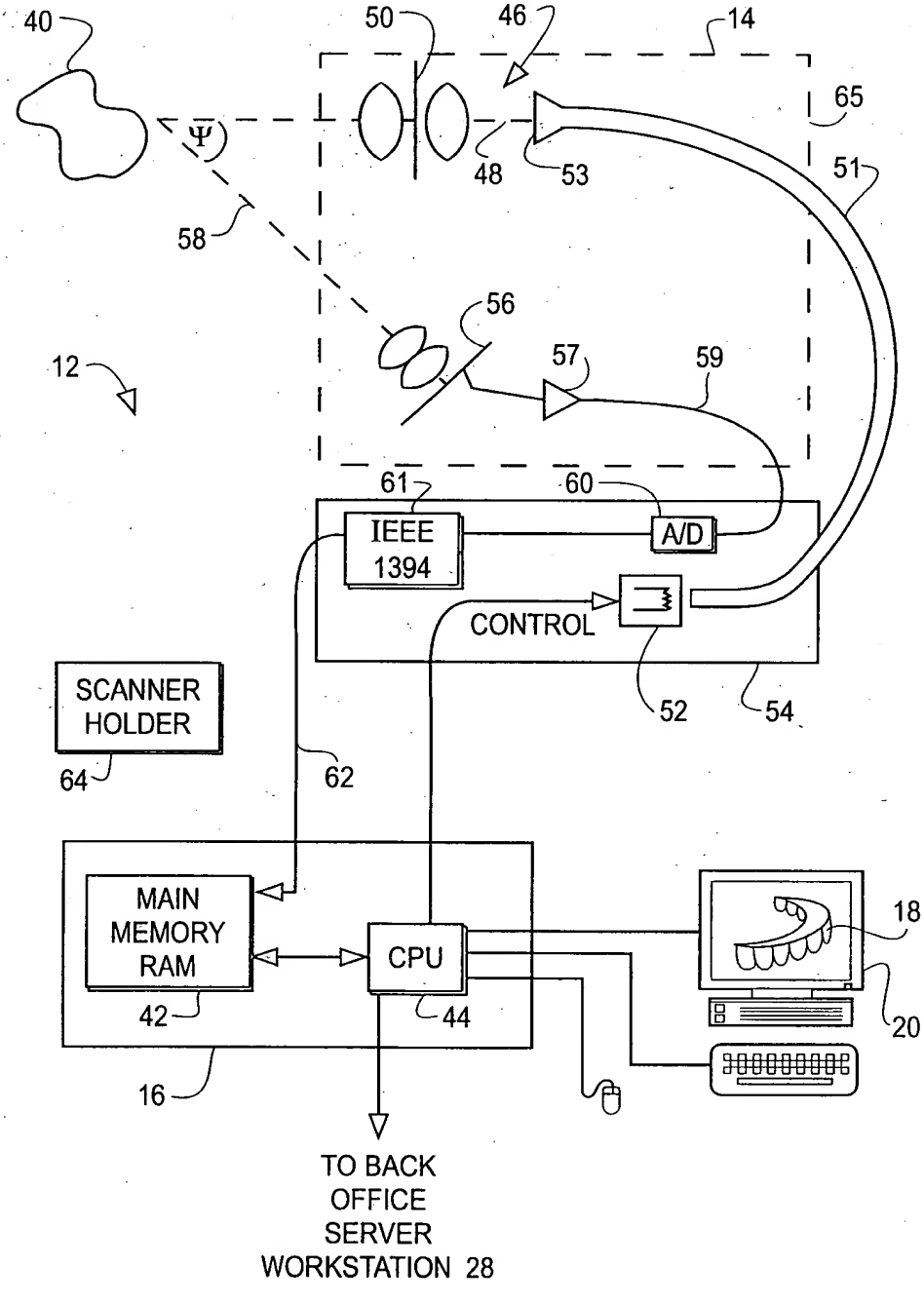

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FIG. 3

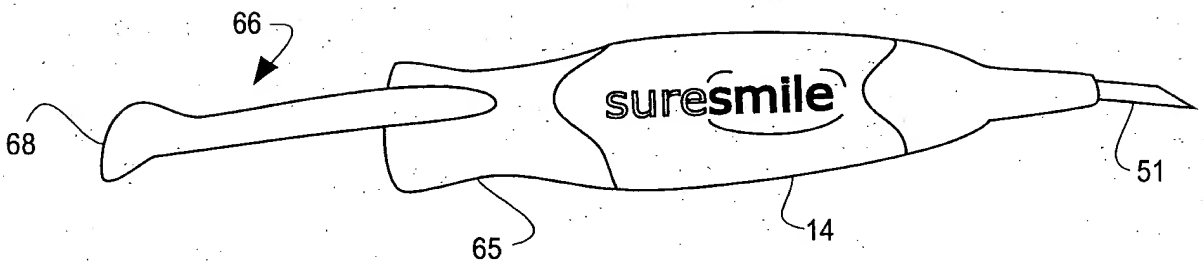

FIG. 4

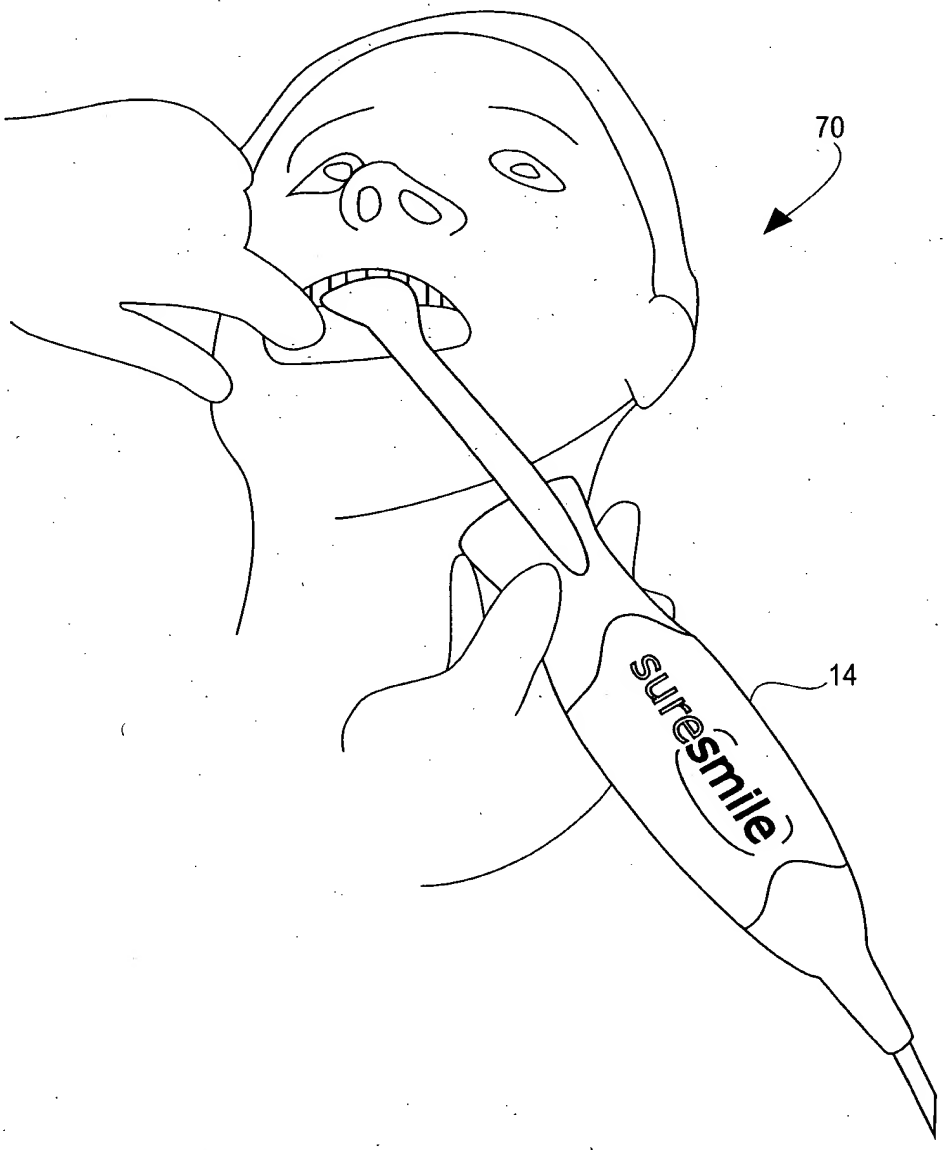

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FIG. 5

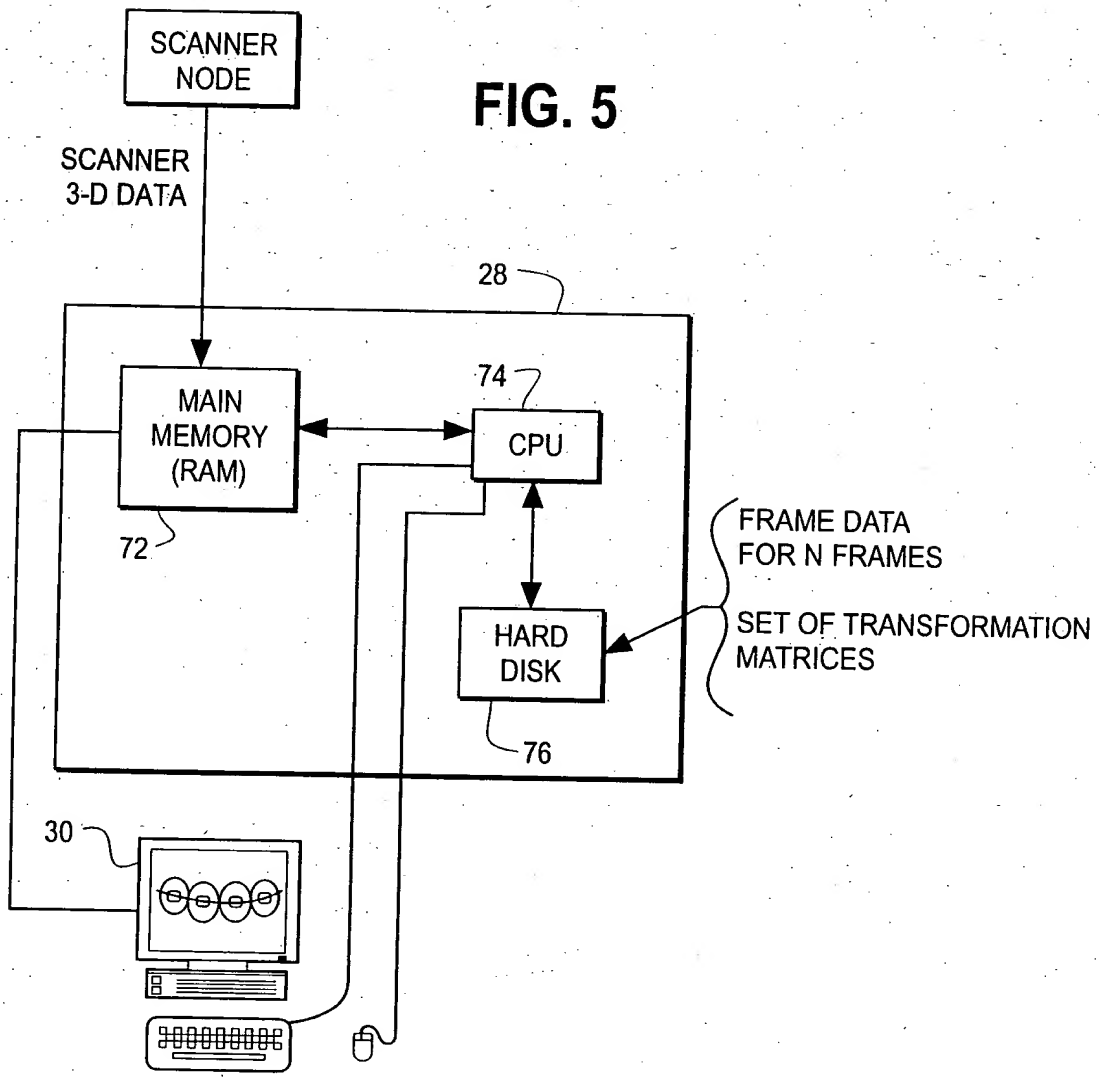

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FIG. 6

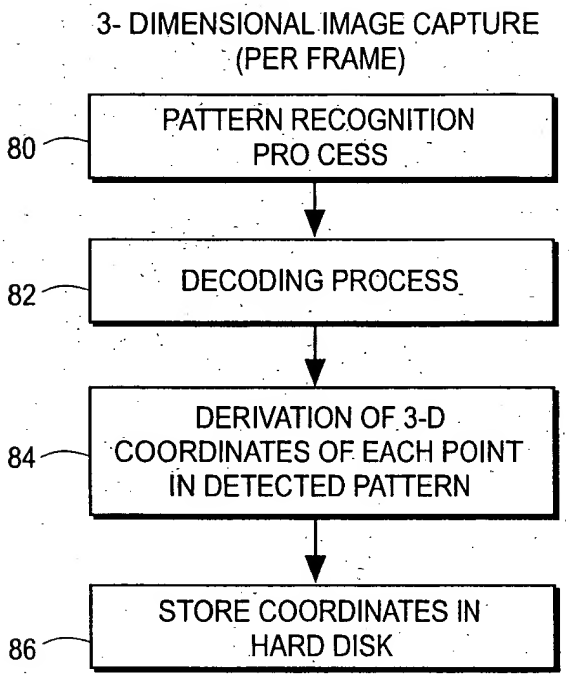

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FIG. 7

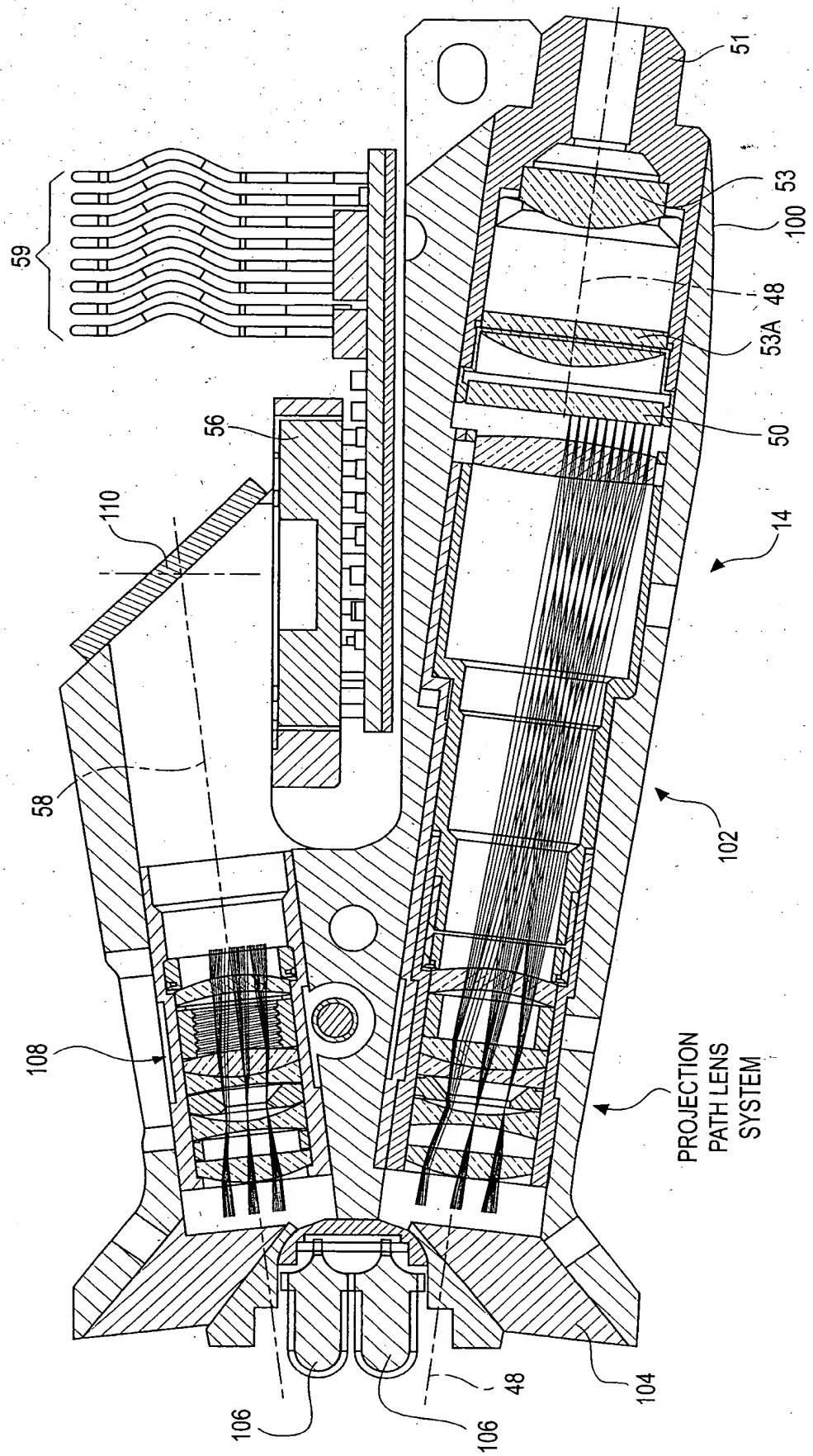

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FIG. 8

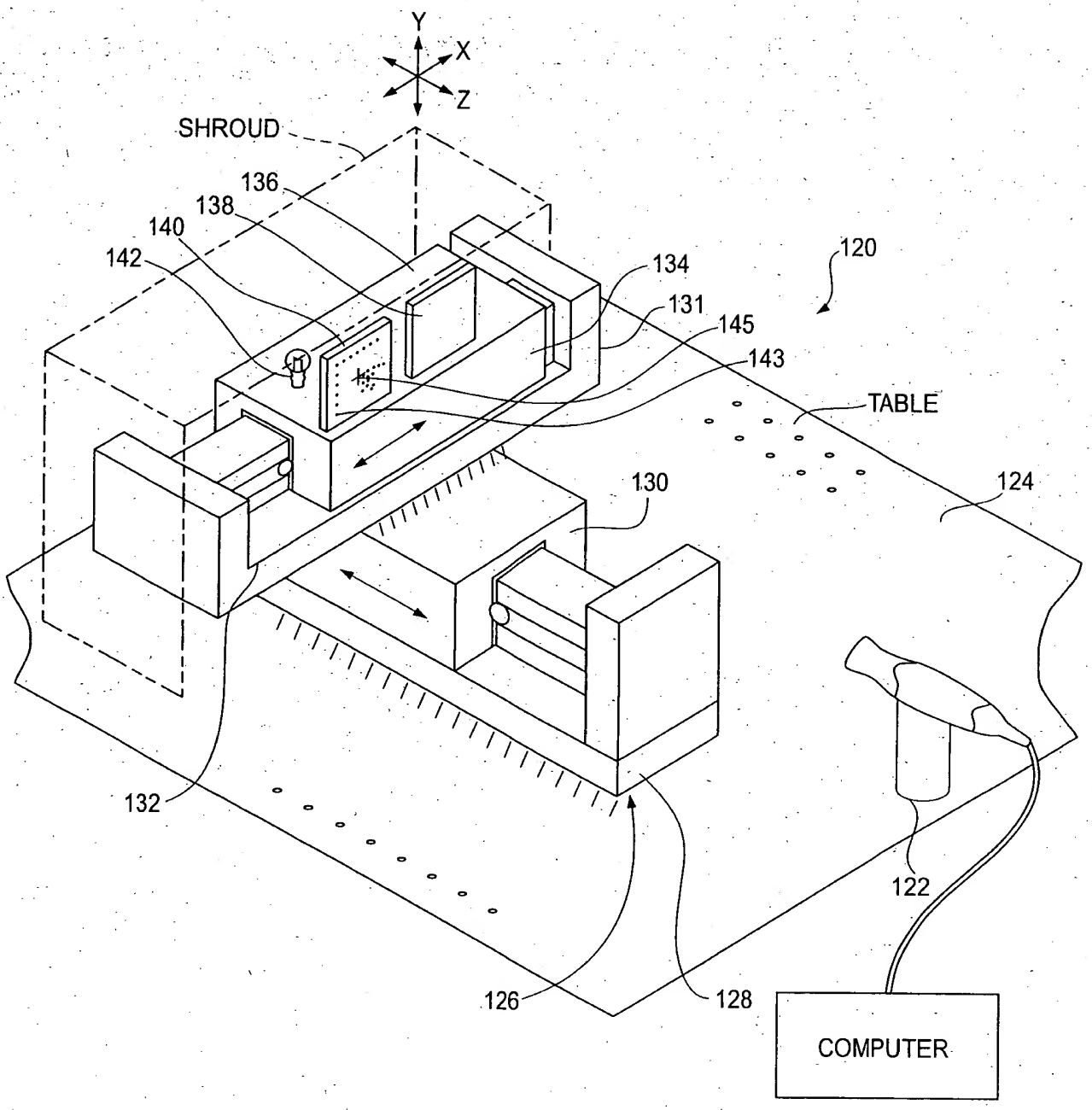

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FIG. 8A

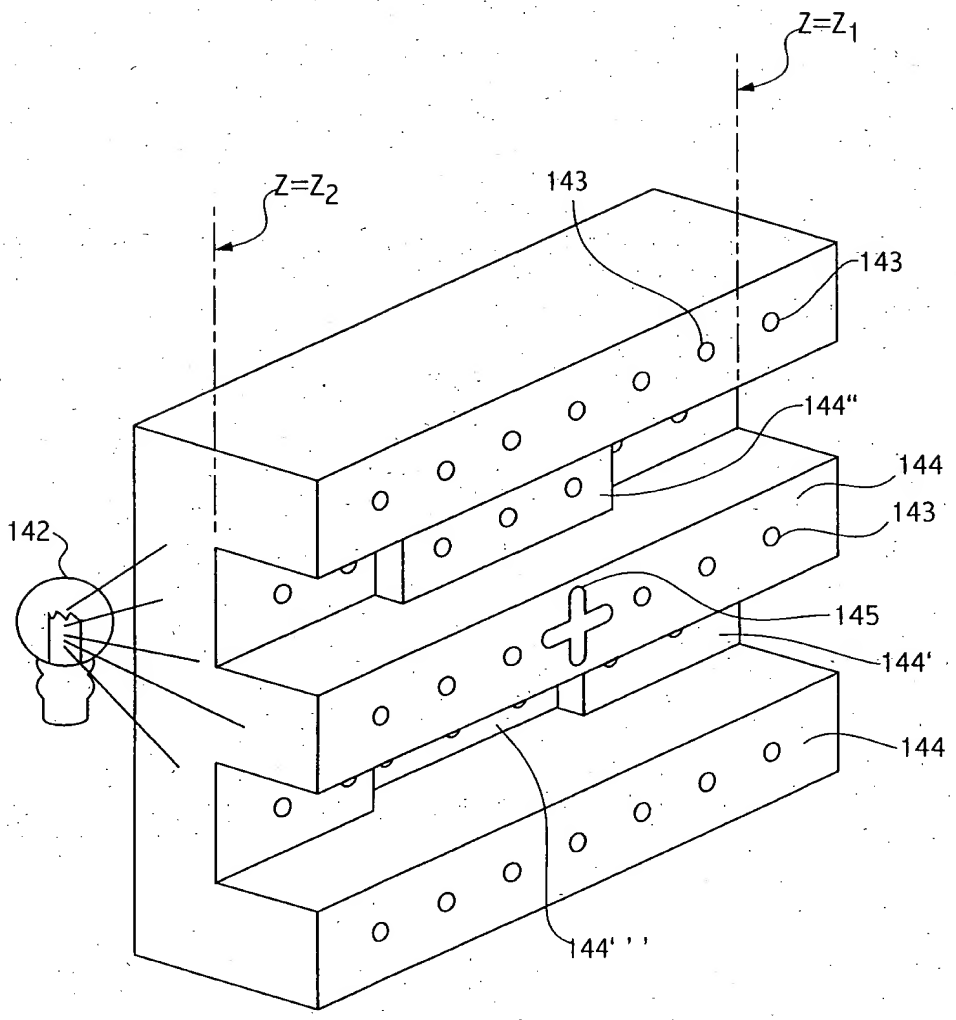

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FIG. 9

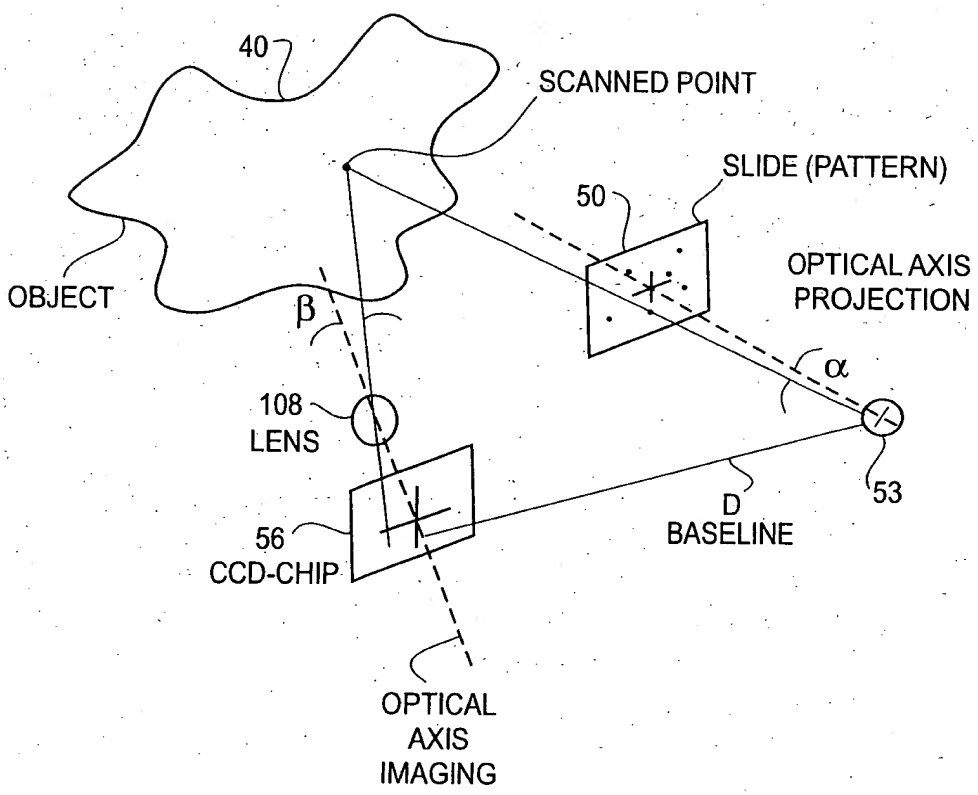

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FIG. 9A

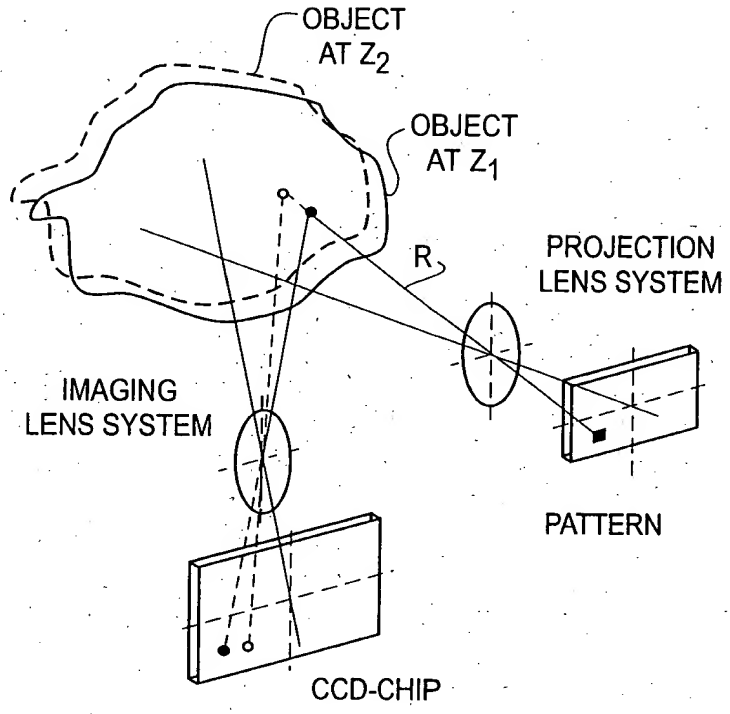


FIG. 9B

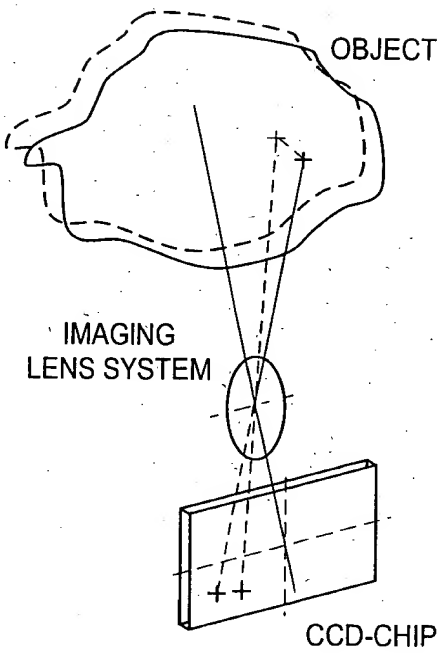
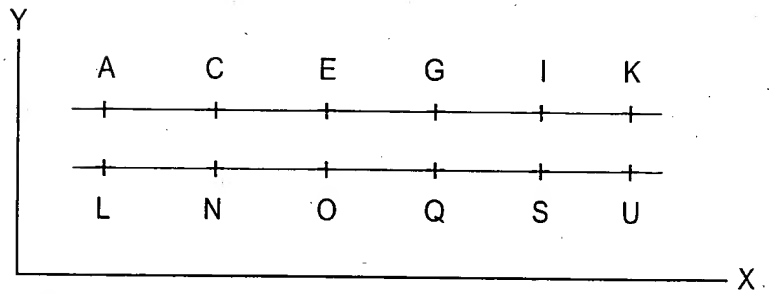


FIG. 9C



PIXEL COORDINATES FOR PORTIONS OF THE PATTERN ASSIGNED TO A CERTAIN Z-LEVEL

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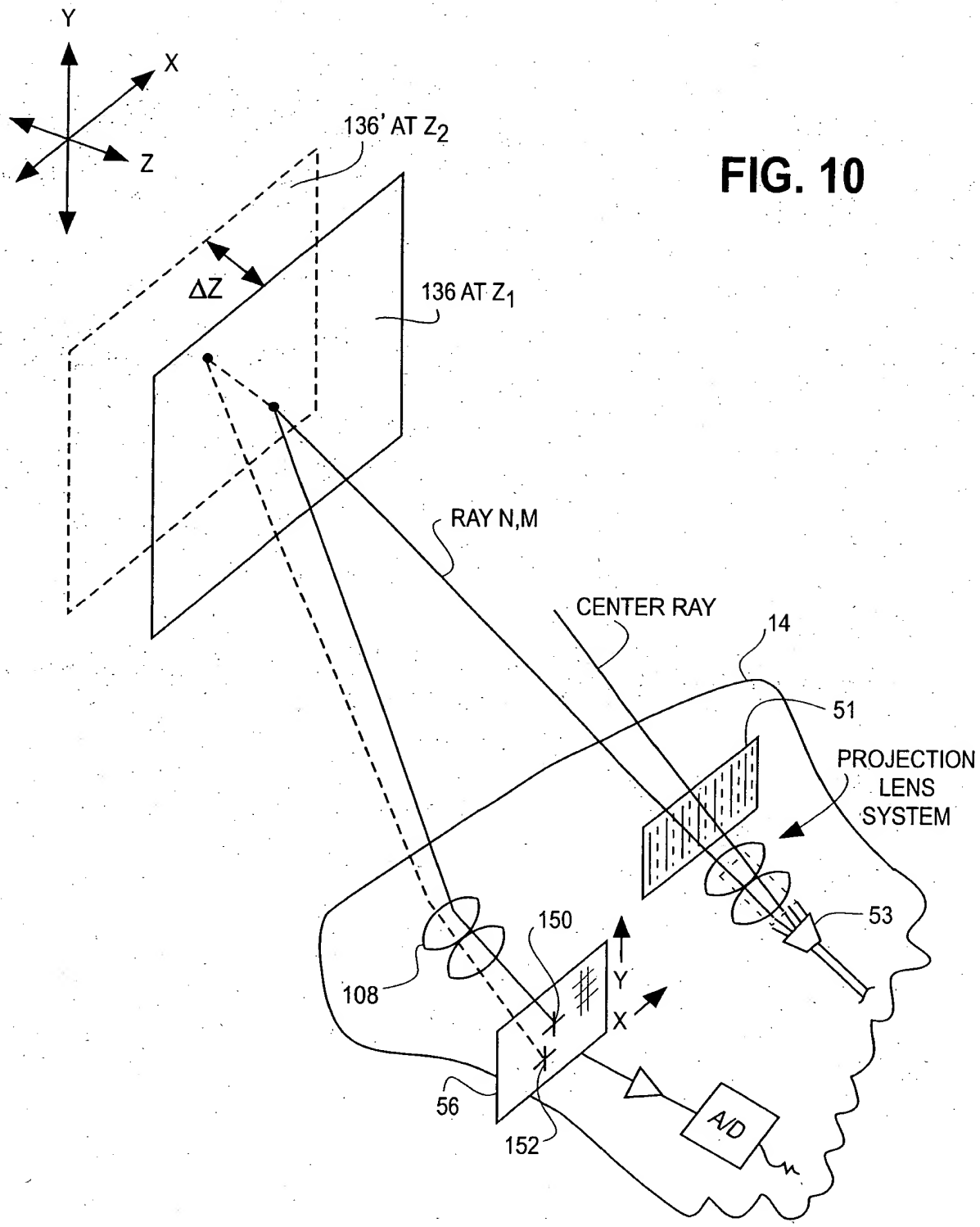

FIG. 10

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FIG. 11

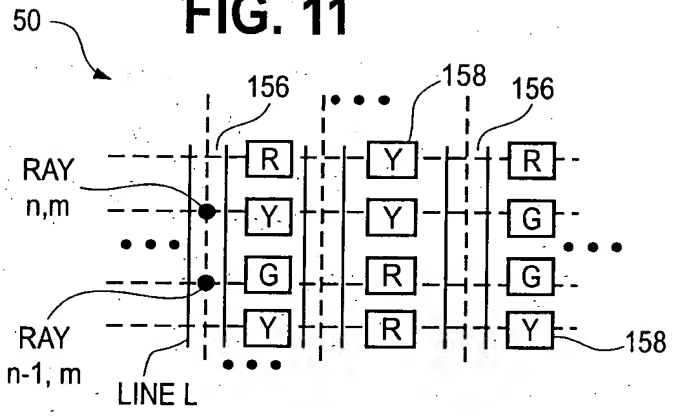

FIG. 12

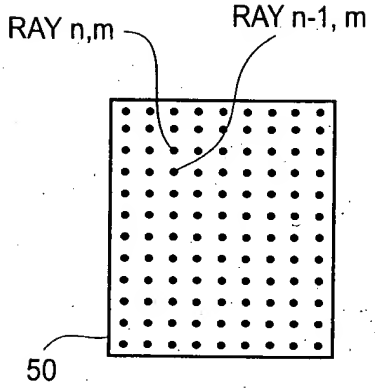

FIG. 13

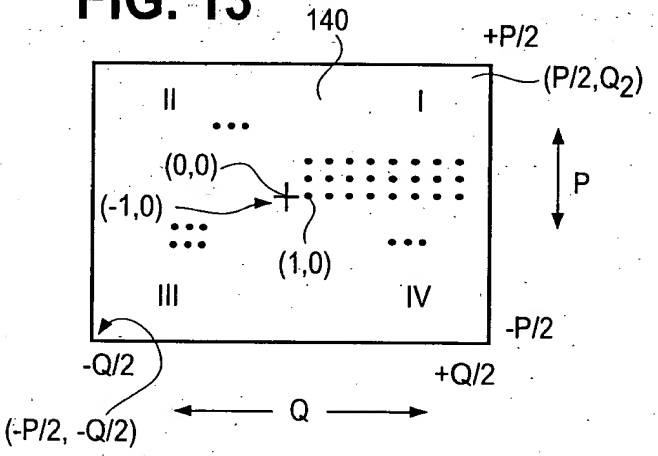

FIG. 14

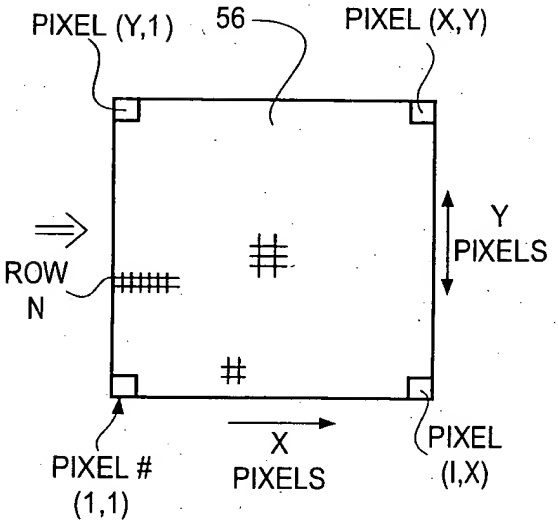

FIG. 15

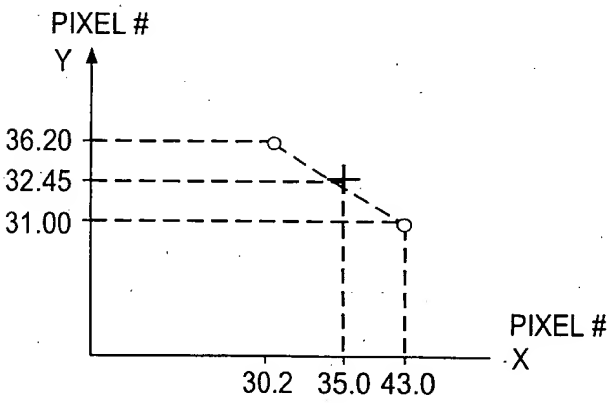

FIG. 16

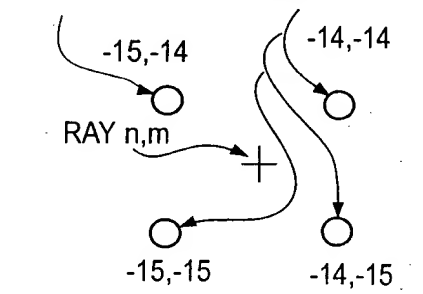

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FIG. 17

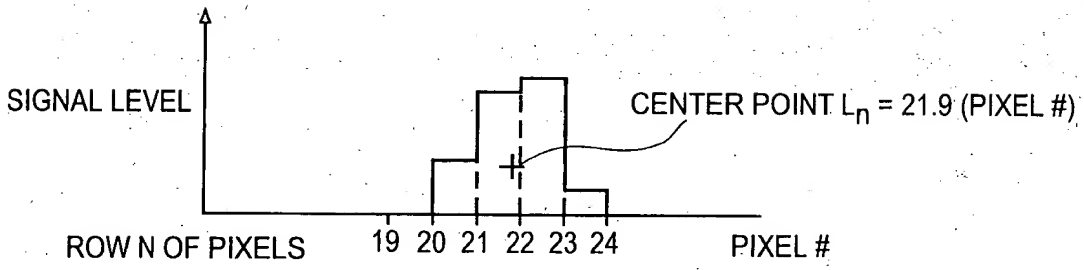

FIG. 18

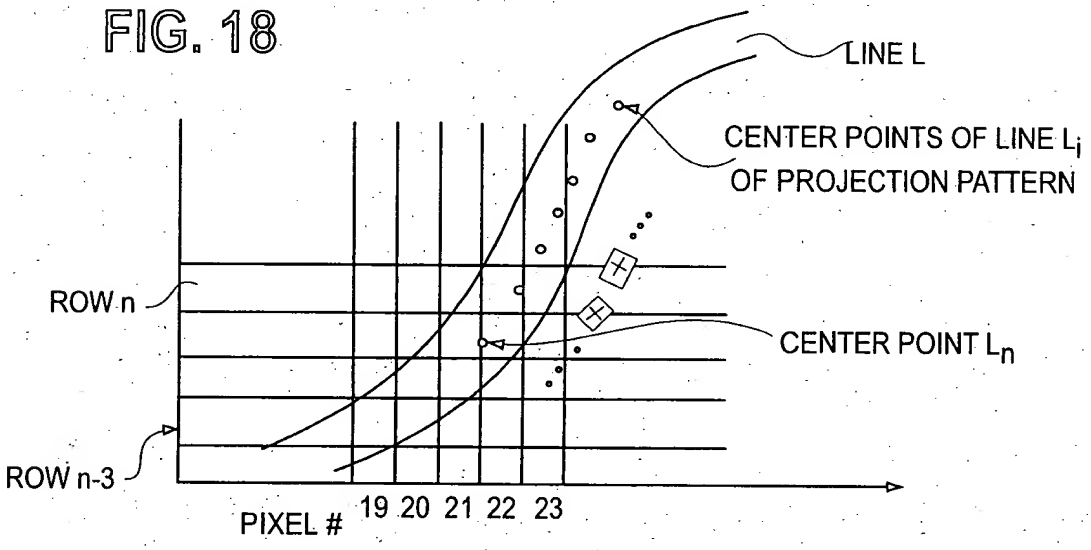

FIG. 19

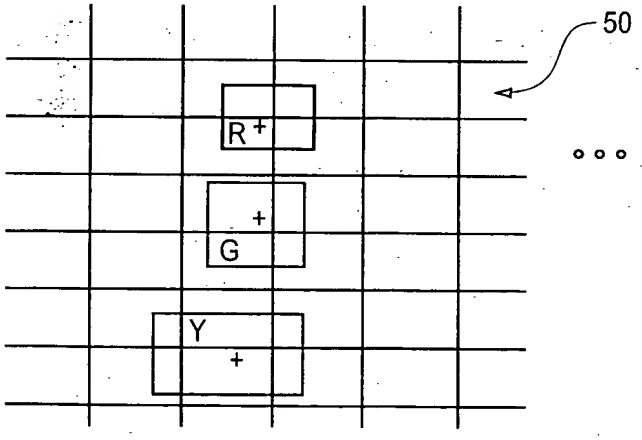

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FIG. 20

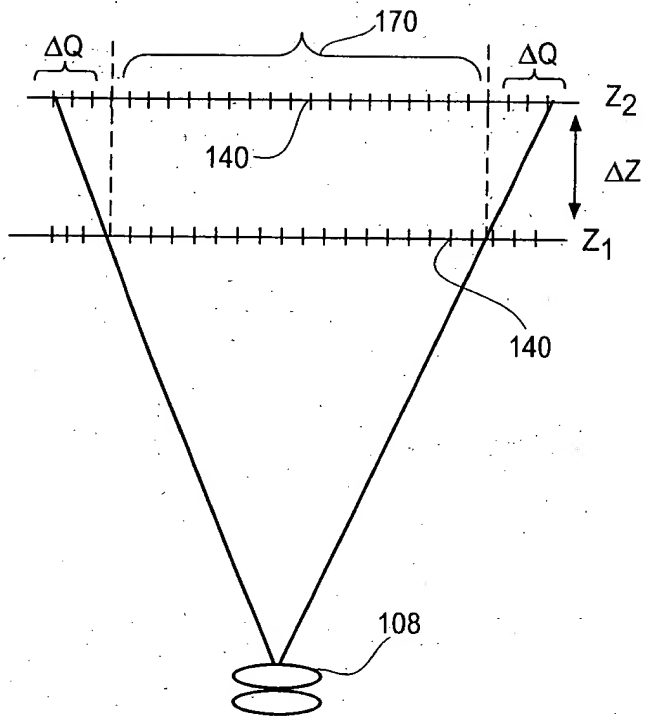

FIG. 21

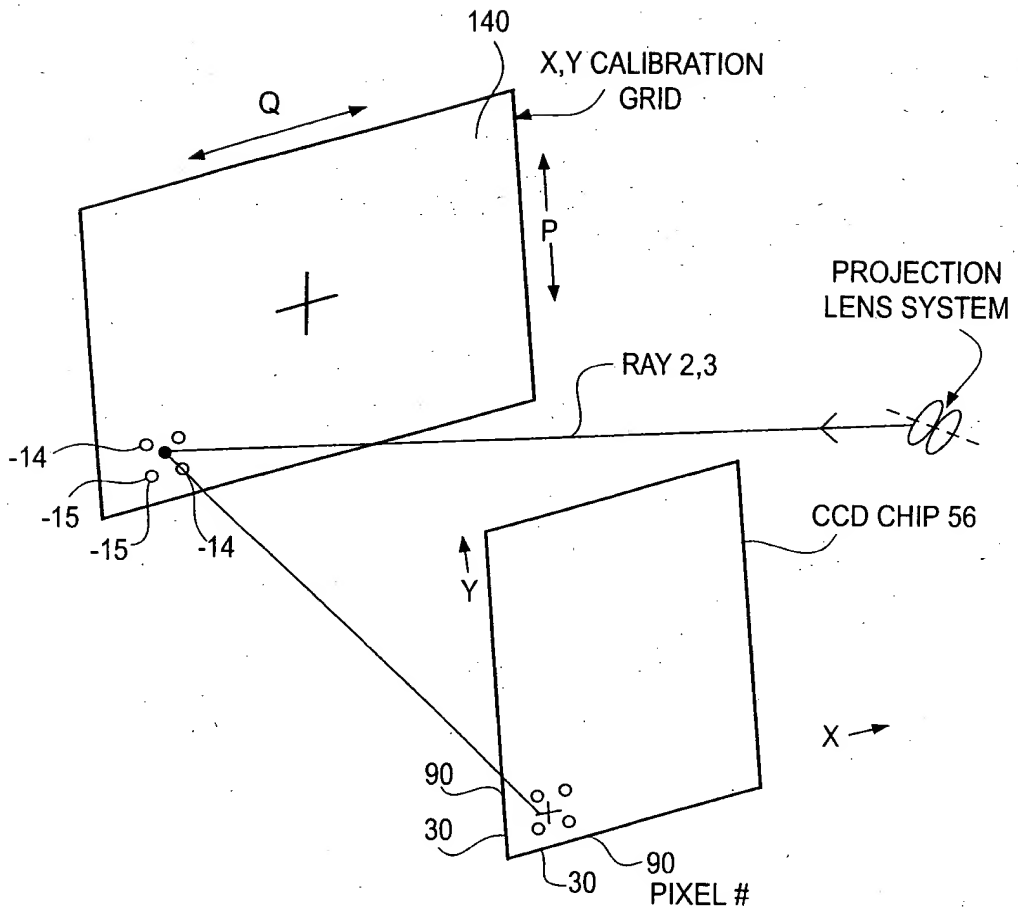

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FIG. 22

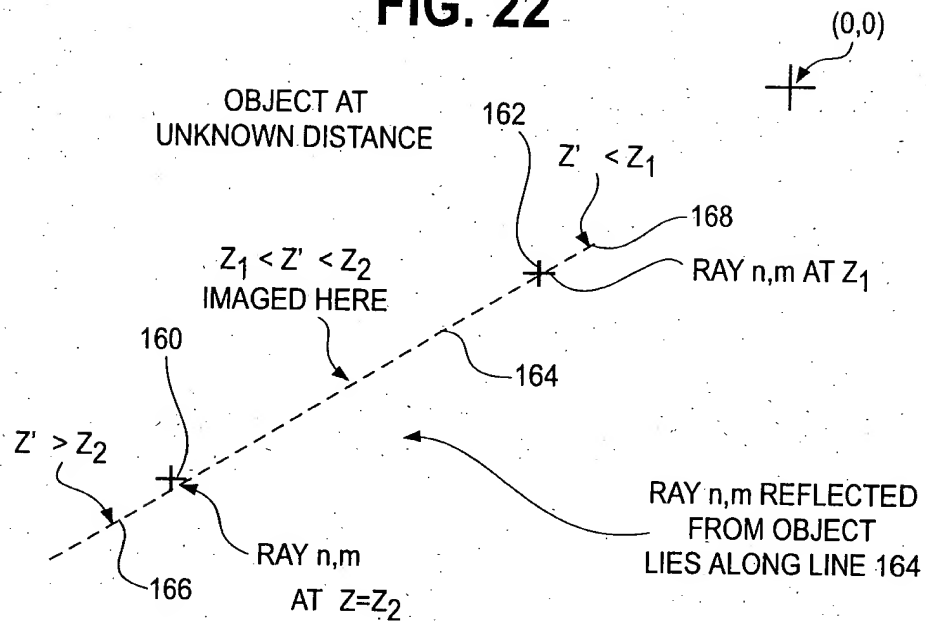

FIG. 23

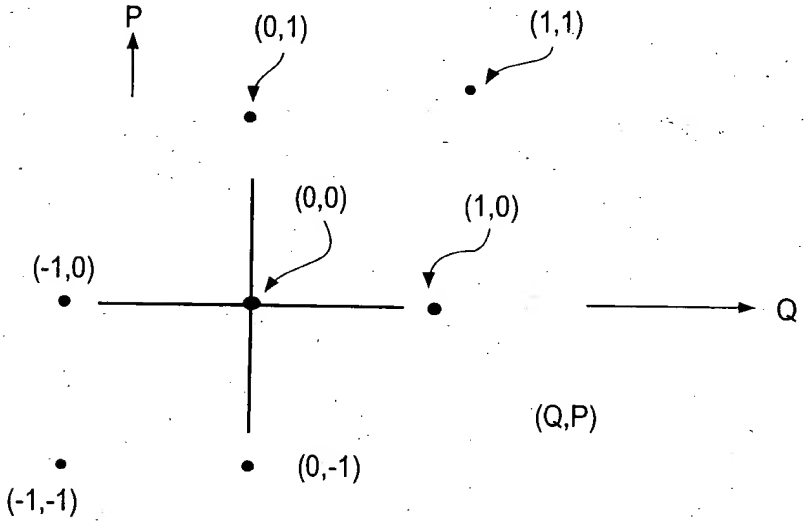

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FIG. 24

CCD_X, CCD_Y = PIXEL #, IN SUBPIXEL RESOLUTION

(BEFORE)

CALIBRATION TABLE #1

		LINE 1						LINE 2						∘ ∘ ∘		LINE N			
		ROW 1	ROW 2	ROW 3	ROW 4	∘ ∘ ∘	ROW M	ROW 1	ROW 2	ROW 3	ROW 4	∘ ∘ ∘	ROW M			ROW 1	ROW 2	∘ ∘ ∘	ROW M
Z_1	CCD_X	1.0	1.1	1.5	2.1		∘ ∘ ∘	27.1	29.5	30.2	37.1								
	MM DIST.																		
	CCD_Y	10.2	20.4	32.8	44.5			11.5	21.6	36.2	44								
	MM DIST.																		
Z_2	CCD_X	3.9	4.5	6.8	12.2			34.0	41.1	43.0	46								
	MM DIST.																		
	CCD_Y	12.1	21.5	30.4	46.3			13.2	21.8	31.0	48.2								
	MM DIST.																		

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FIG. 25

CALIBRATION TABLE #2

(Q,P)

QUADRANT I

		ROW 0								ROW 1					ROW + P/2			
		(0,0)	(1,0)	(2,0)	(3,0)	• • •	(Q/2 - ΔQ,0)	• • •	(Q/210)	(0,1)	(1,1)	(2,1)	• • •	• • •	(0, P/2)	(1, P/2)	• • •	(Q/2, P/2)
Z_1	CCD_X	640.1	700.2	760.6	820.5	• • •	• • •		—	640.1	700.2	• • •			• • •	• • •		1,279.5
	CCD_Y	640.1	640.1	640.3	640.4		• • •		—	701.2	701.5	• • •			• • •	• • •		1,279.4
Z_2	CCD_X	640.2	680.3	741.2	801.6		• • •		1,279.5	• • •	681.2	• • •			• • •	• • •		1,256.4
	CCD_Y	640.2	640.3	640.1	640.1		• • •		640.2	• • •	680.9	• • •			• • •	• • •		1,251.5

QUADRANT II

		ROW								ROW 1					ROW +P/2			
		(-1,0)	(-2,0)	(-3,0)	(-4, 0)	• • •	(-Q/2 - ΔQ,0)	• • •	(-Q/210)	(-1,1)	(-2,1)	(-3,1)	• • •	• • •	(-1, P/2)	(-2, P/2)	• • •	(-Q/2, P/2)
Z_1	CCD_X																	
	CCD_Y																	
Z_2	CCD_X																	
	CCD_Y																	

Z_1	CCD_X	(-1,-1)	(-2,-1)	• • •	QUADRANT III • • •	• • •
	CCD_Y	—	—			
Z_2	CCD_X	—	—			
	CCD_Y	—	—			

Z_1	CCD_X	(0,-1)	(1,-1)	• • •	QUADRANT IV • • •	• • •
	CCD_Y	—	—			
Z_2	CCD_X	—	—			
	CCD_Y	—	—			

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FIG. 26

CCD_X, CCD_Y = PIXEL #, IN SUBPIXEL RESOLUTION

CALIBRATION TABLE #1 (AFTER)

	PATTERN						PATTERN									
	LINE 1						LINE 2						LINE N			
	ROW 1	ROW 2	ROW 3	ROW 4	∘ ∘ ∘	ROW M	ROW 1	ROW 2	ROW 3	ROW 4	∘ ∘ ∘	ROW M	ROW 1	ROW 2	∘ ∘ ∘	ROW M
Z_1 CCD_X	1.0	1.1	1.5	2.1		∘ ∘ ∘	27.1	29.5	30.2	37.1						
MM DIST.									-14.6							
Z_1 CCD_Y	10.2	20.4	32.8	44.5			11.5	21.6	36.2	44						
MM DIST.									-14.4							
Z_2 CCD_X	3.9	4.5	6.8	12.2			34.0	41.1	43.0	46						
MM DIST.									-14.8							
Z_2 CCD_Y	12.1	21.5	30.4	46.3			13.2	21.8	31.0	48.2						
MM DIST.									-15.8							

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Fig. 27

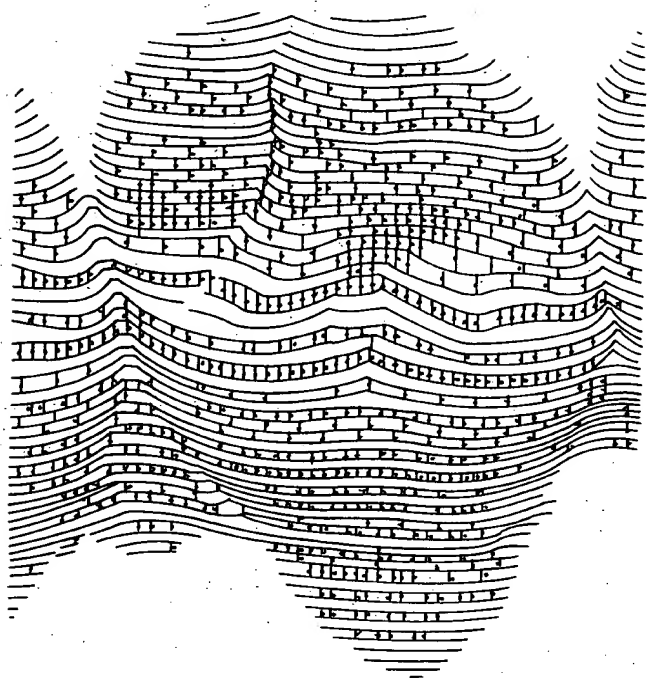

Fig. 28

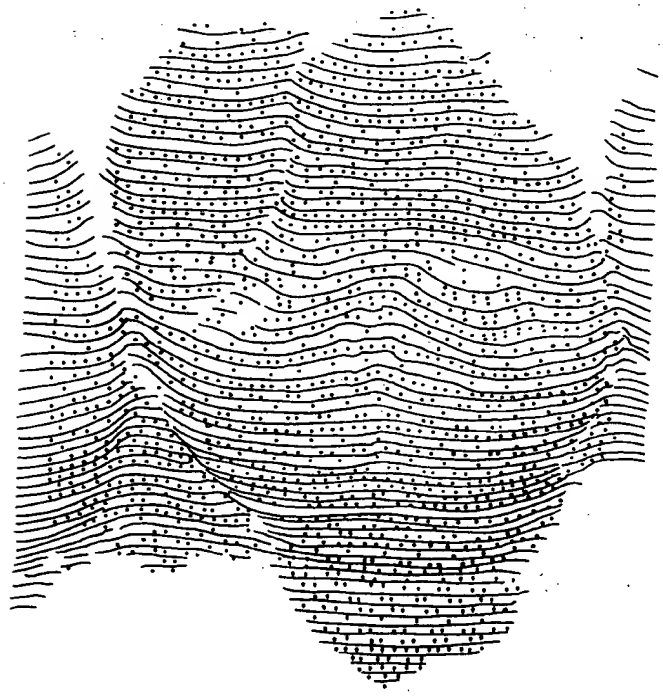

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Fig. 29

Fig. 30

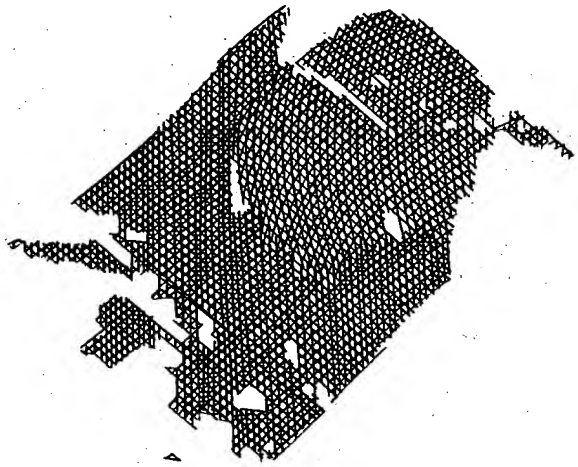

Fig. 31

Fig. 32

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Fig. 33

Fig. 34

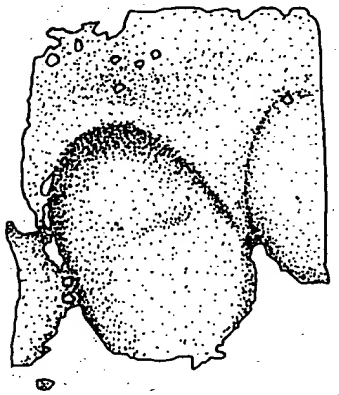

Fig. 35

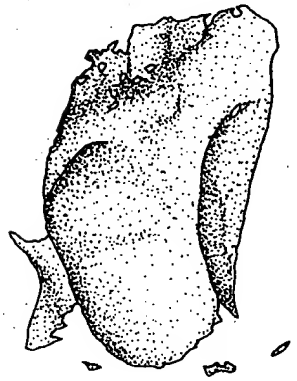

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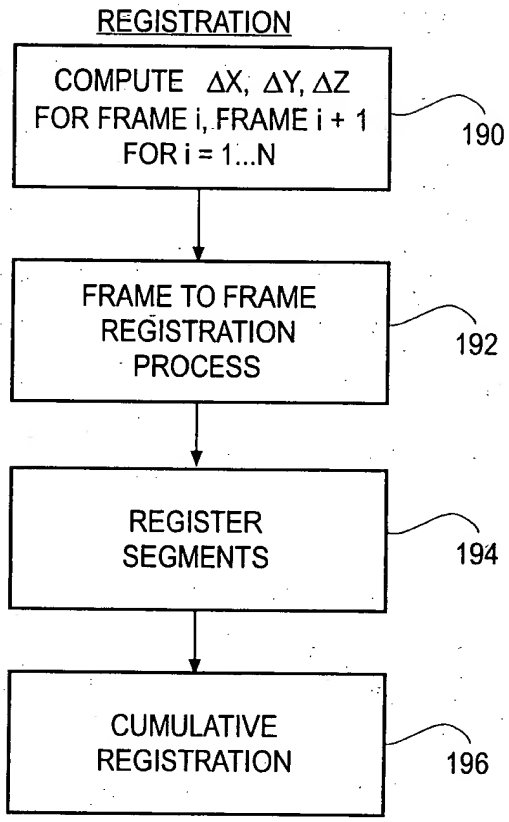
FIG. 36



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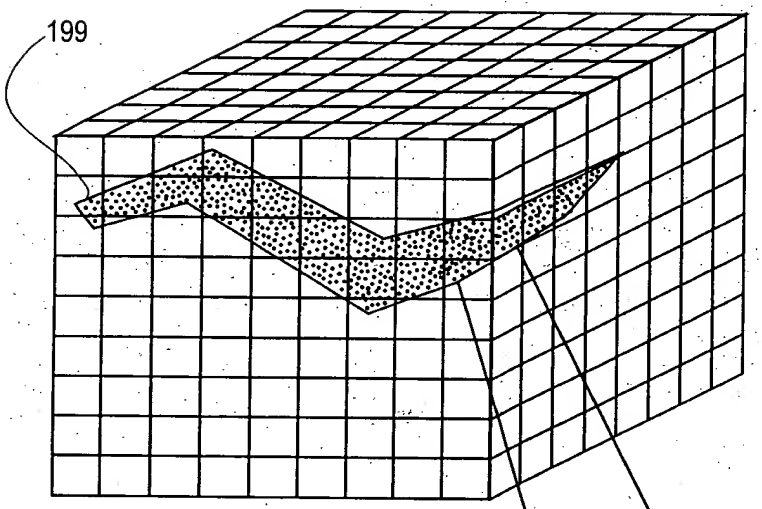

FIG. 37A

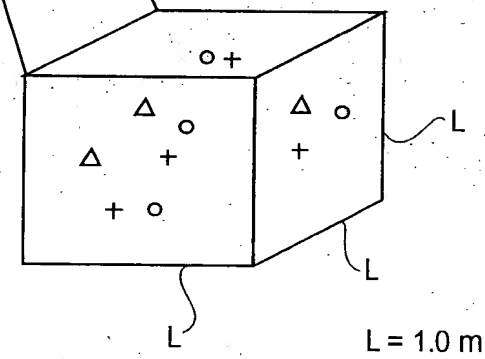

FIG. 37B

L = 1.0 mm

△ = POINTS OF FRAME i
+ = POINTS OF FRAME i + 1
o = POINTS OF FRAME i + 2

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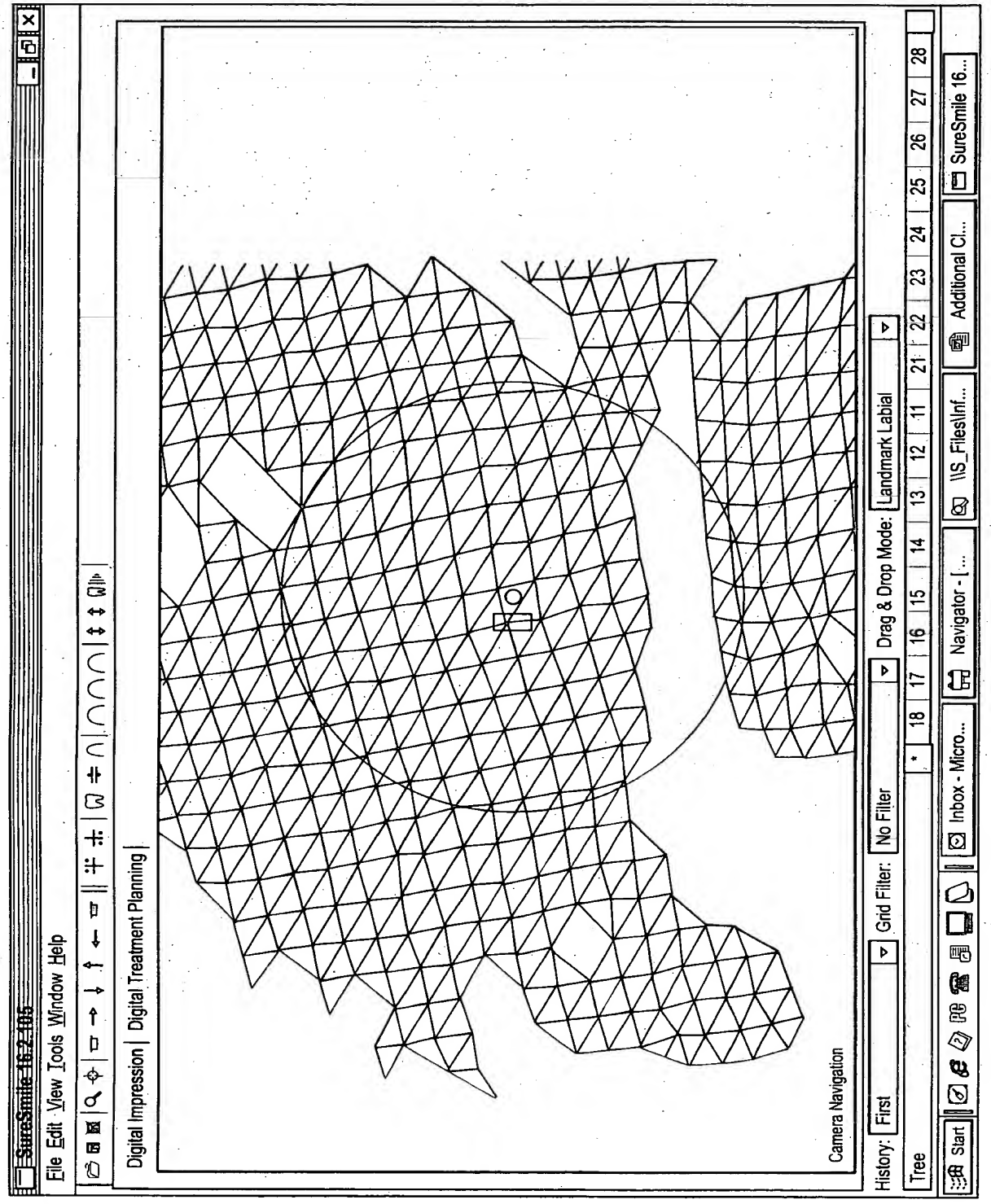

FIG. 37C

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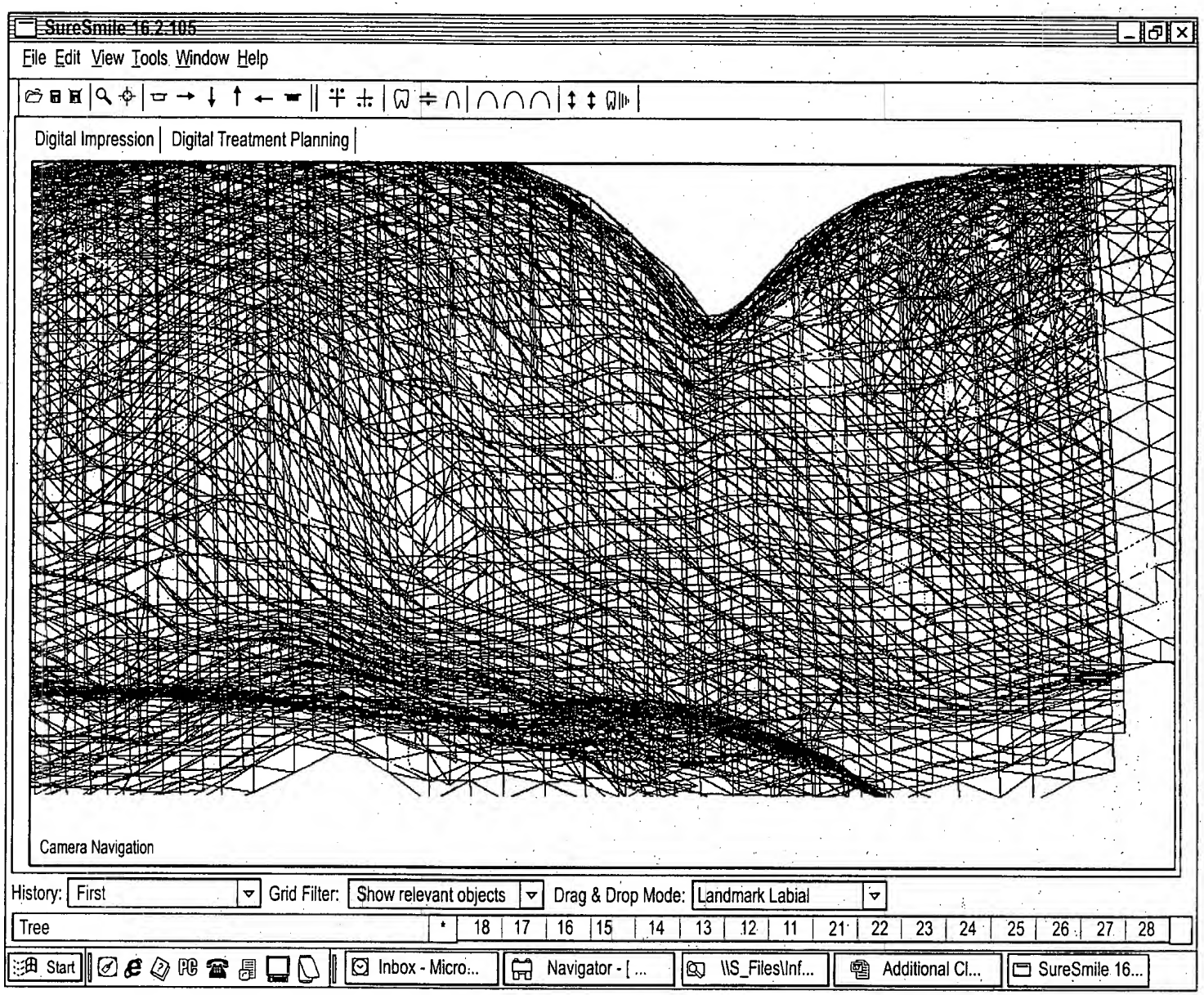
FIG. 37D



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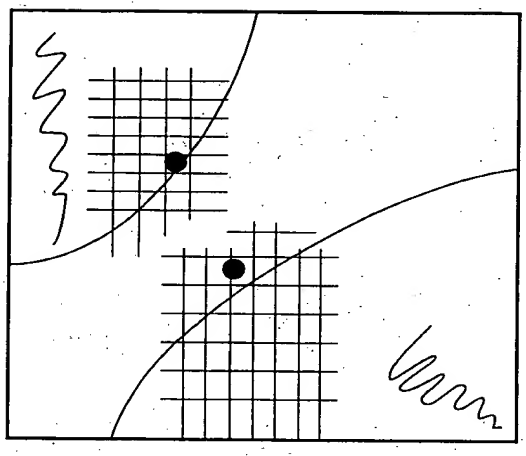

FIG. 38A

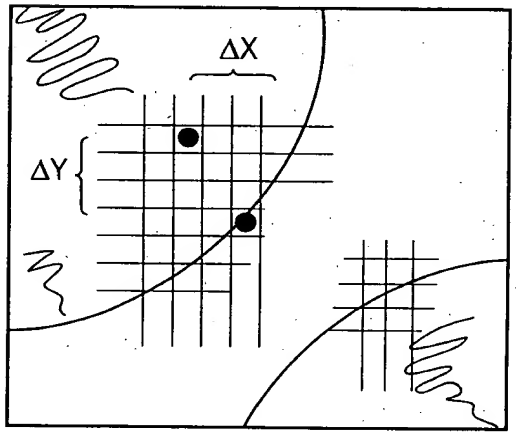

FIG. 38B

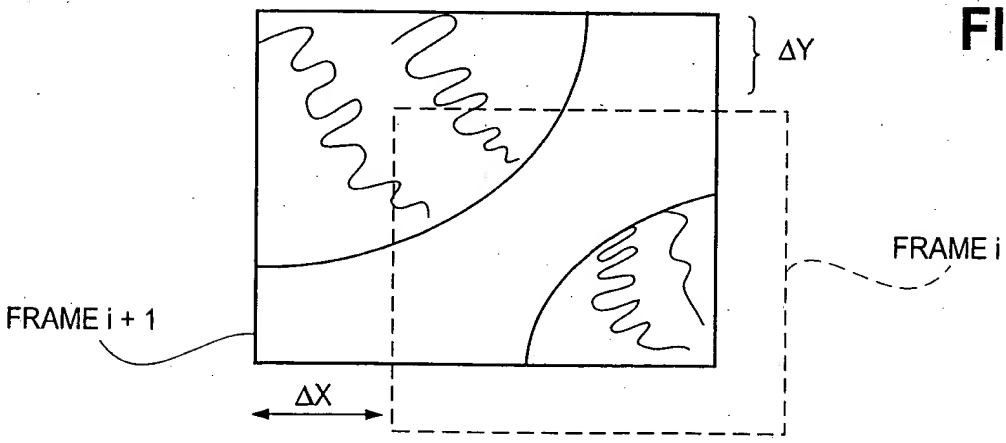

FIG. 38C

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FIG. 39A

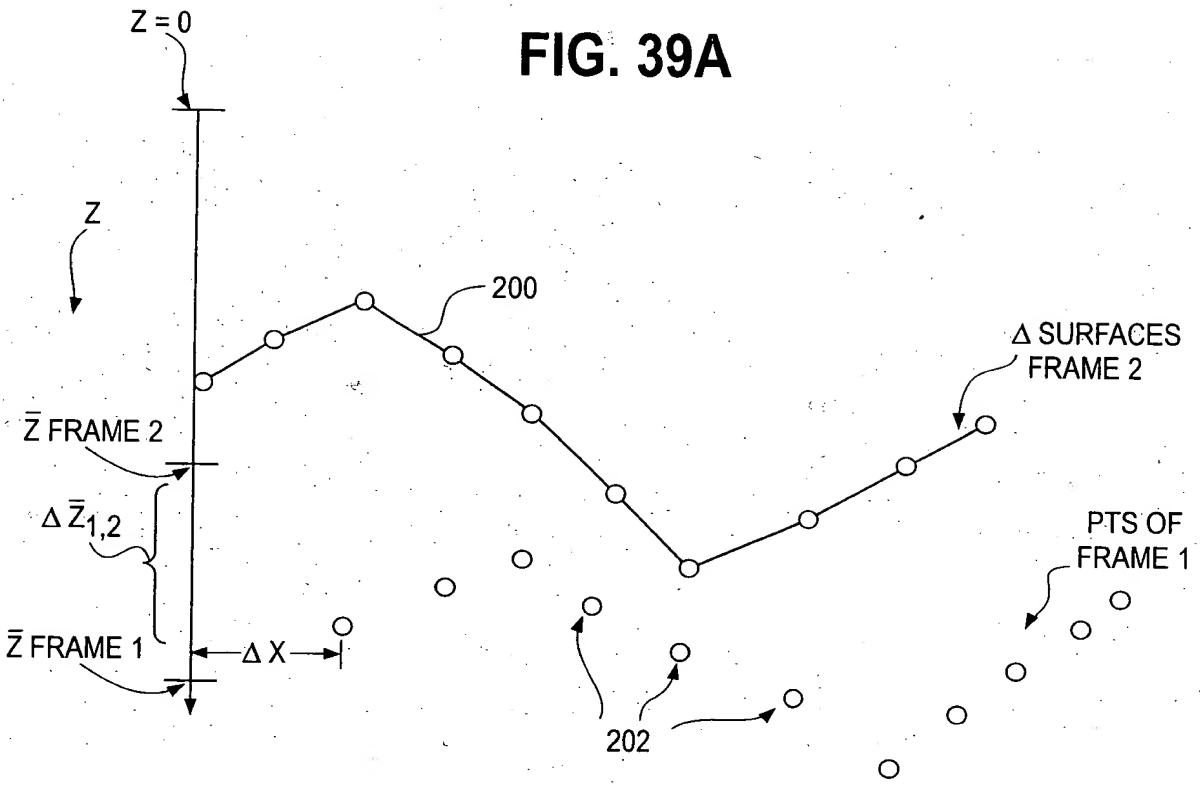

FIG. 39B

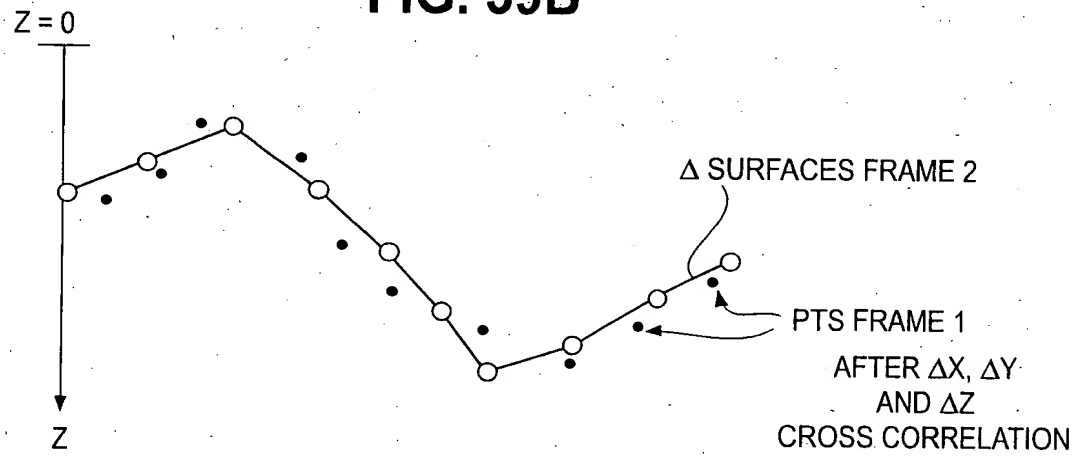

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FIG. 40A

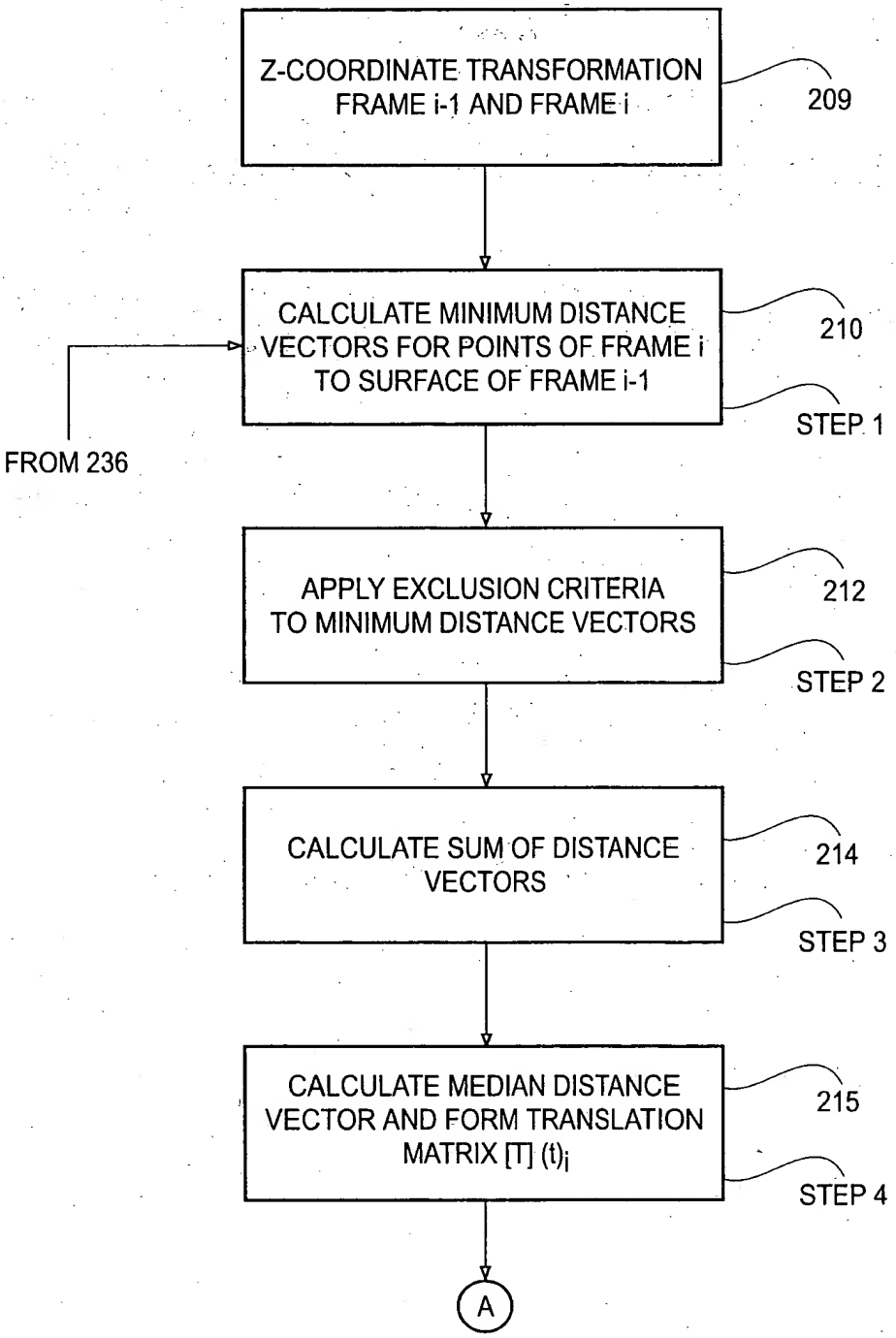

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FIG. 40B

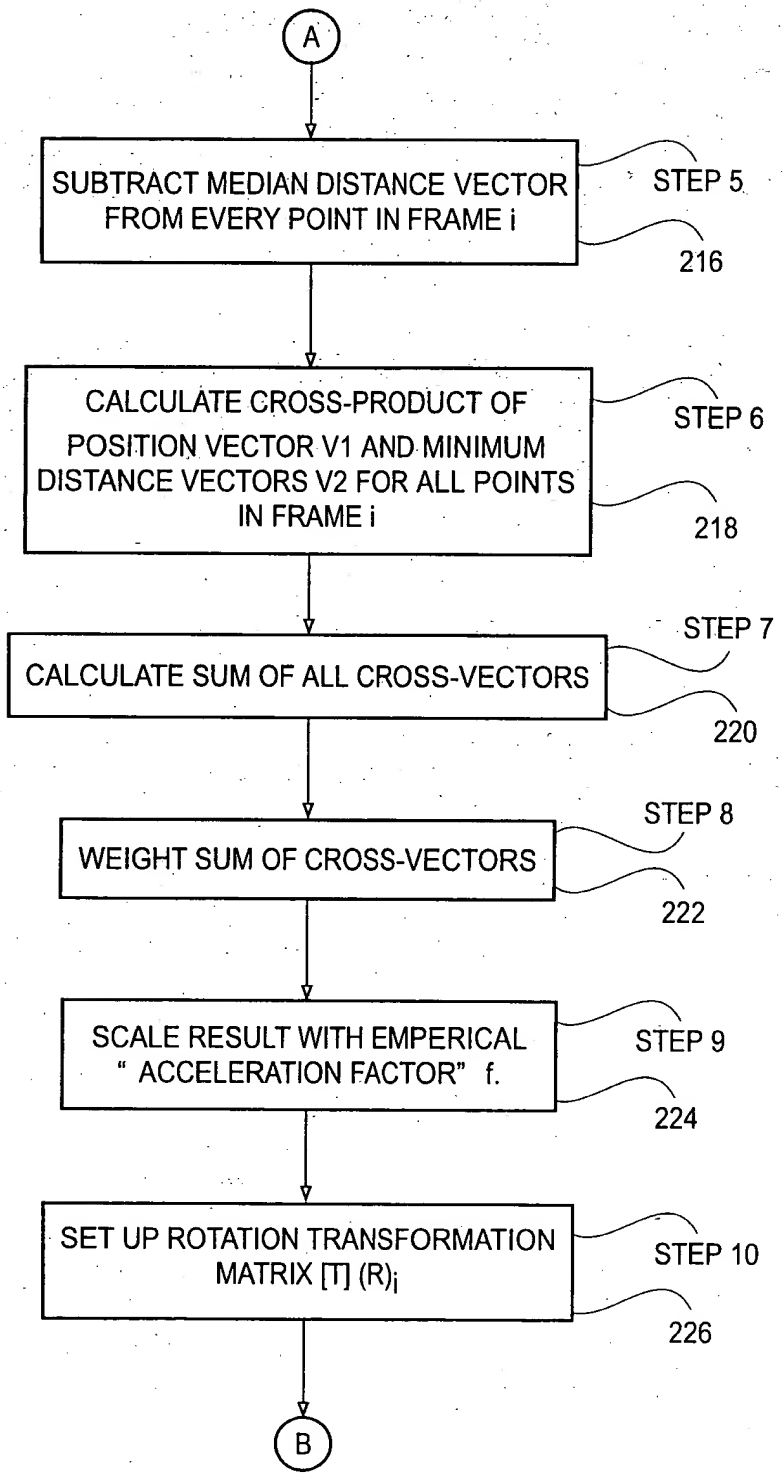

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FIG. 40C

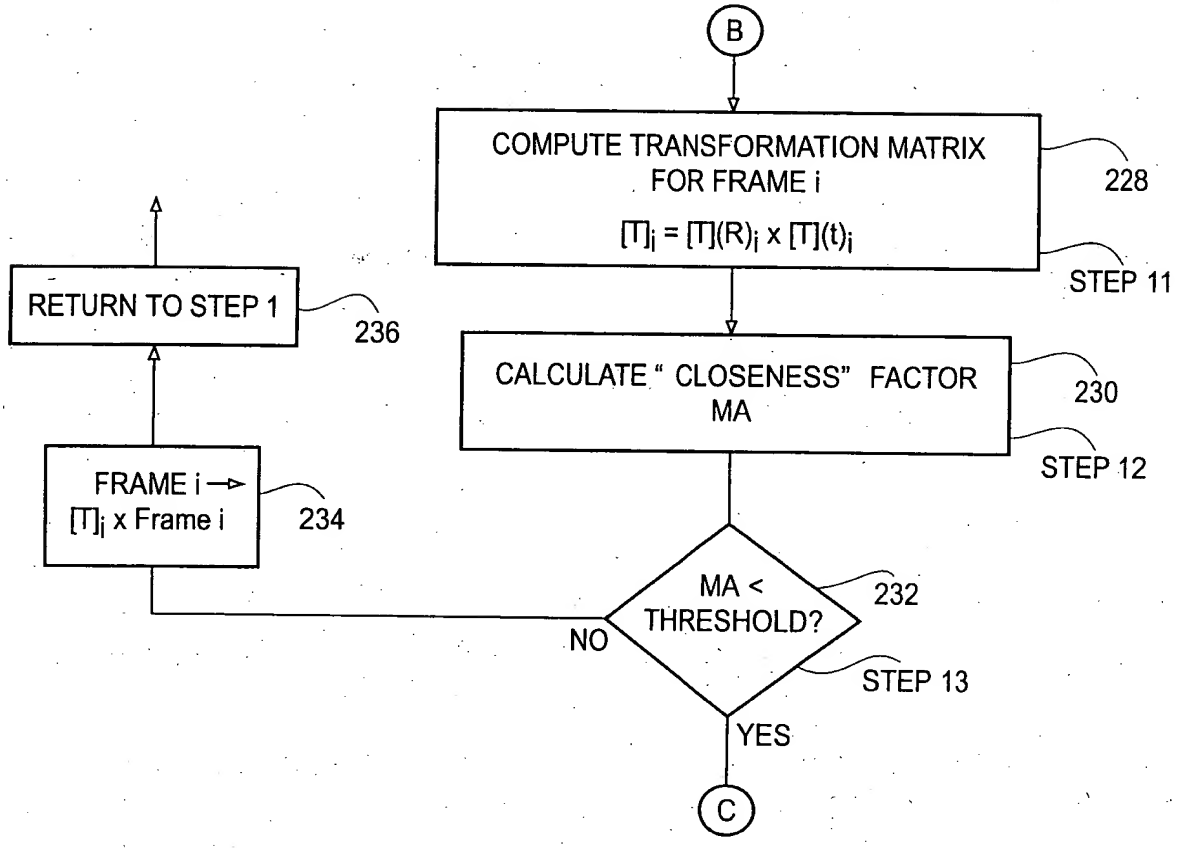

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FIG. 40D

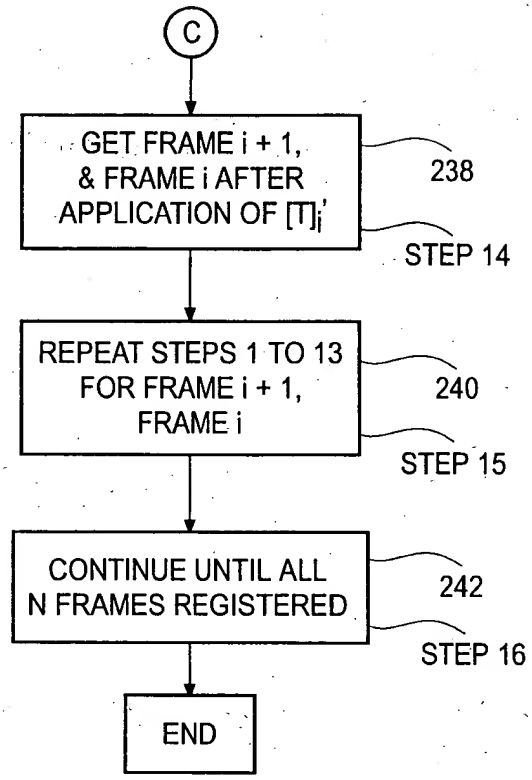

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FIG. 41

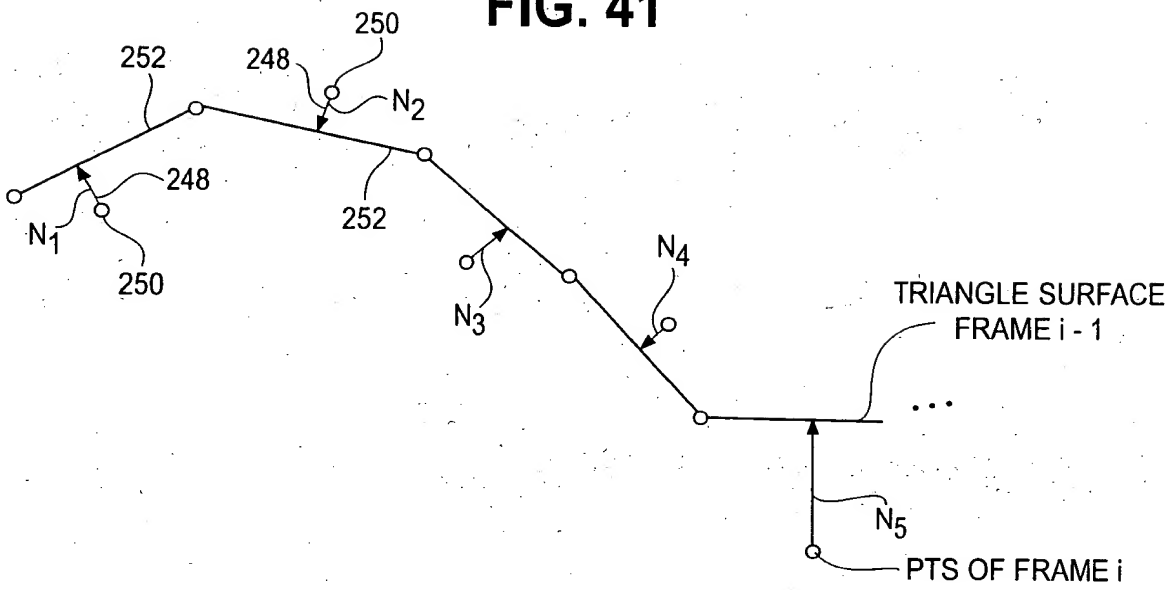

FIG. 42

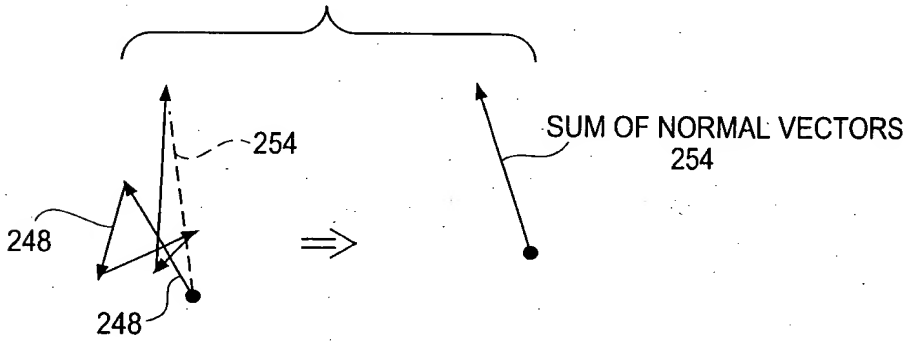

FIG. 43

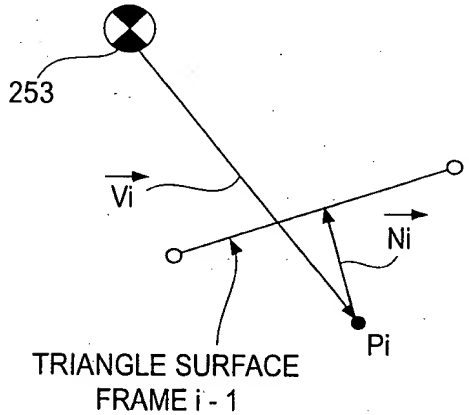

FIG. 44

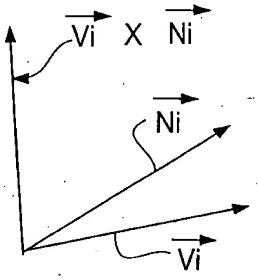

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FIG. 45

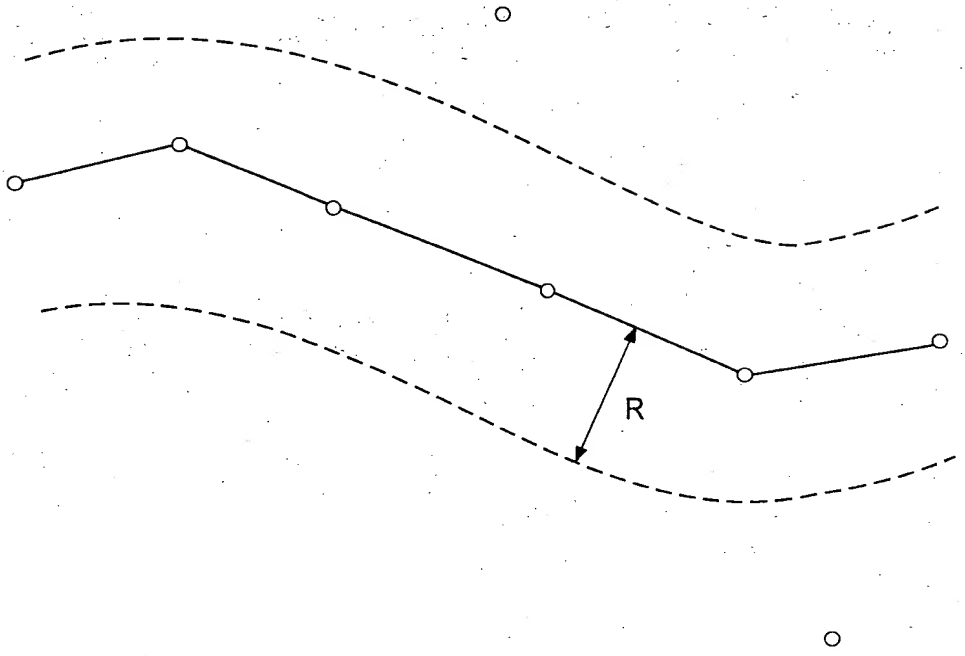

FIG. 46

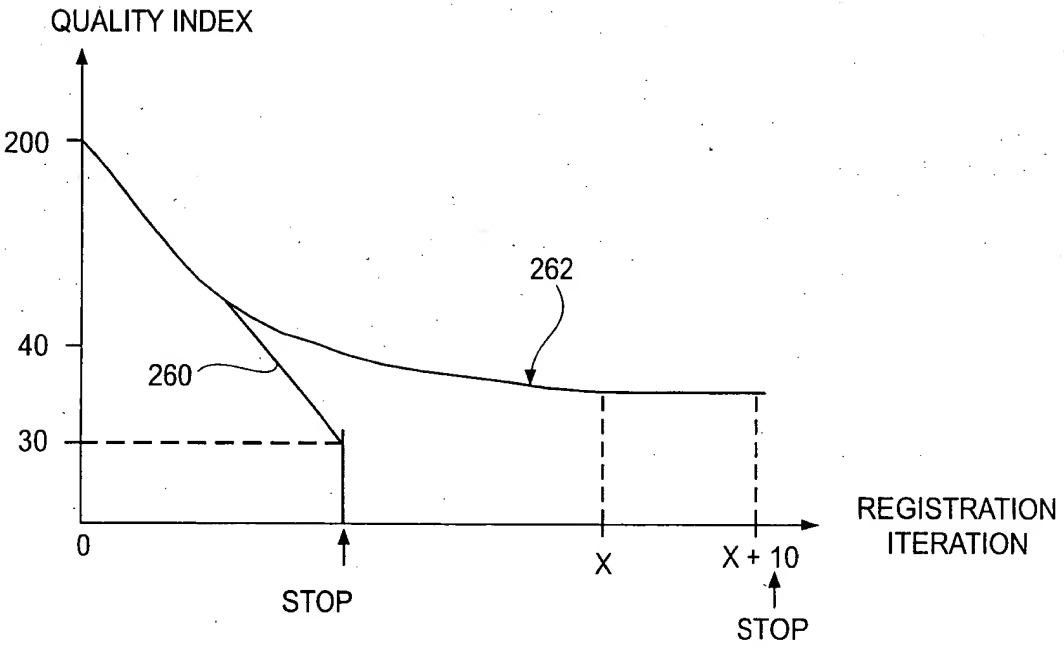

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FIG. 47A

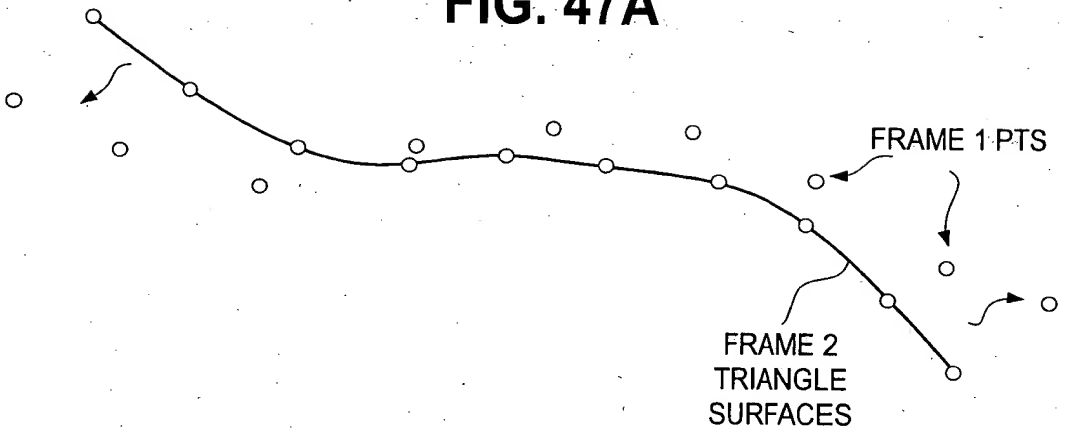

FIG. 47B

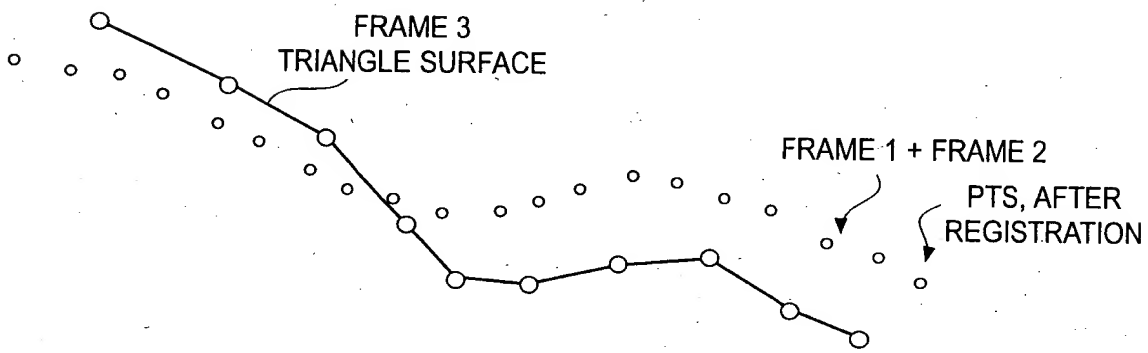

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FIG. 48A

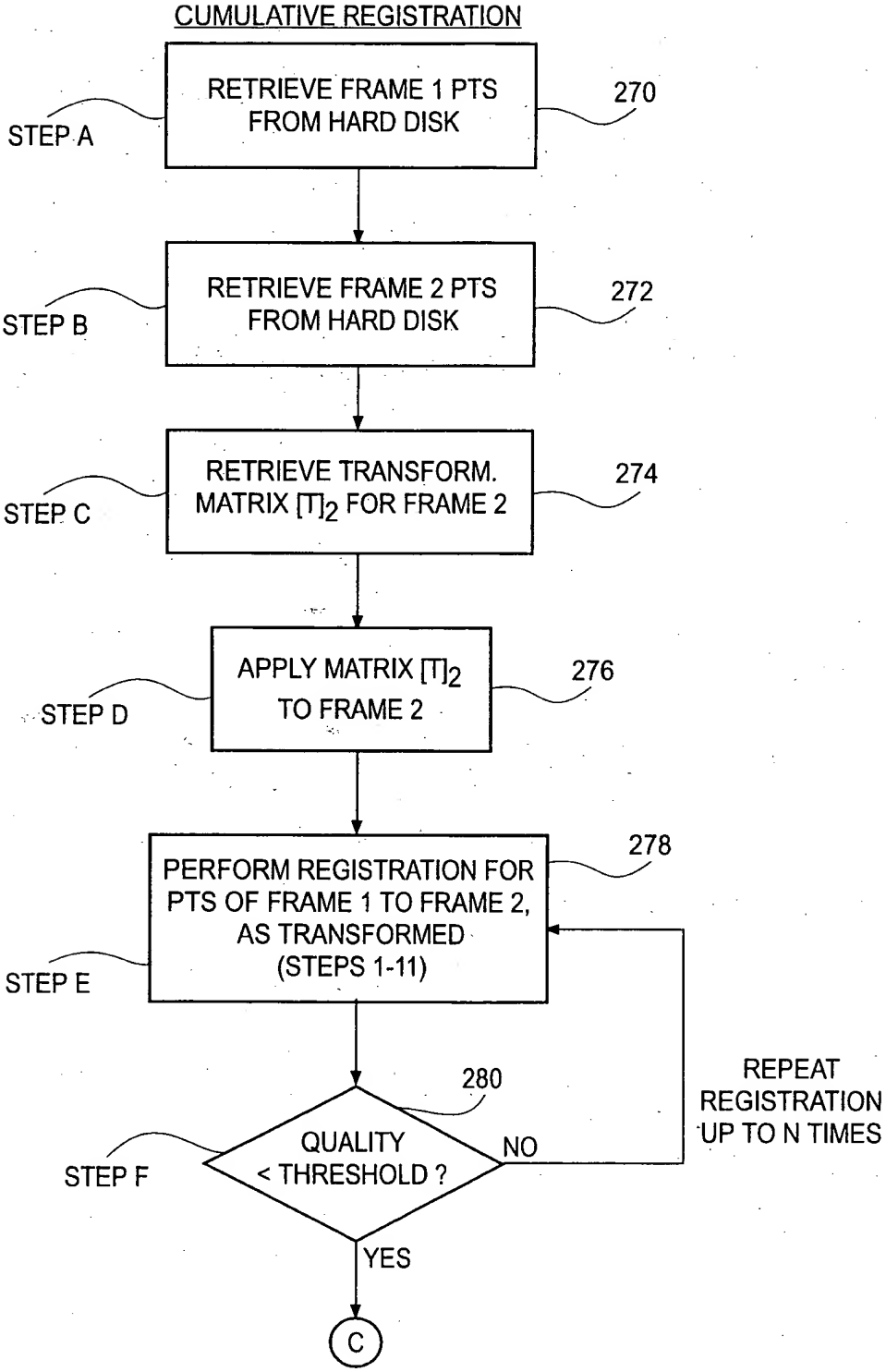

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FIG. 48B

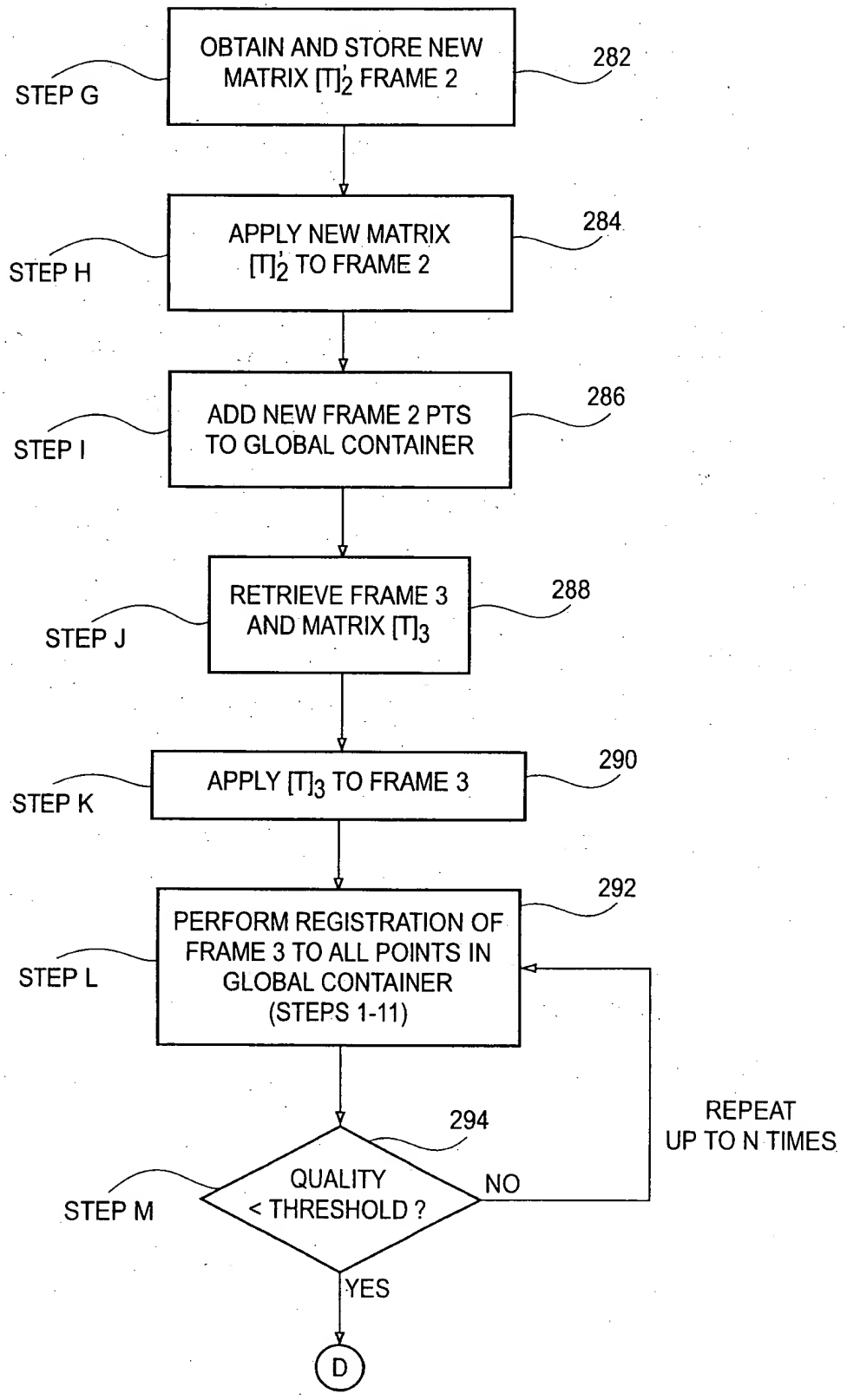

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FIG. 48C

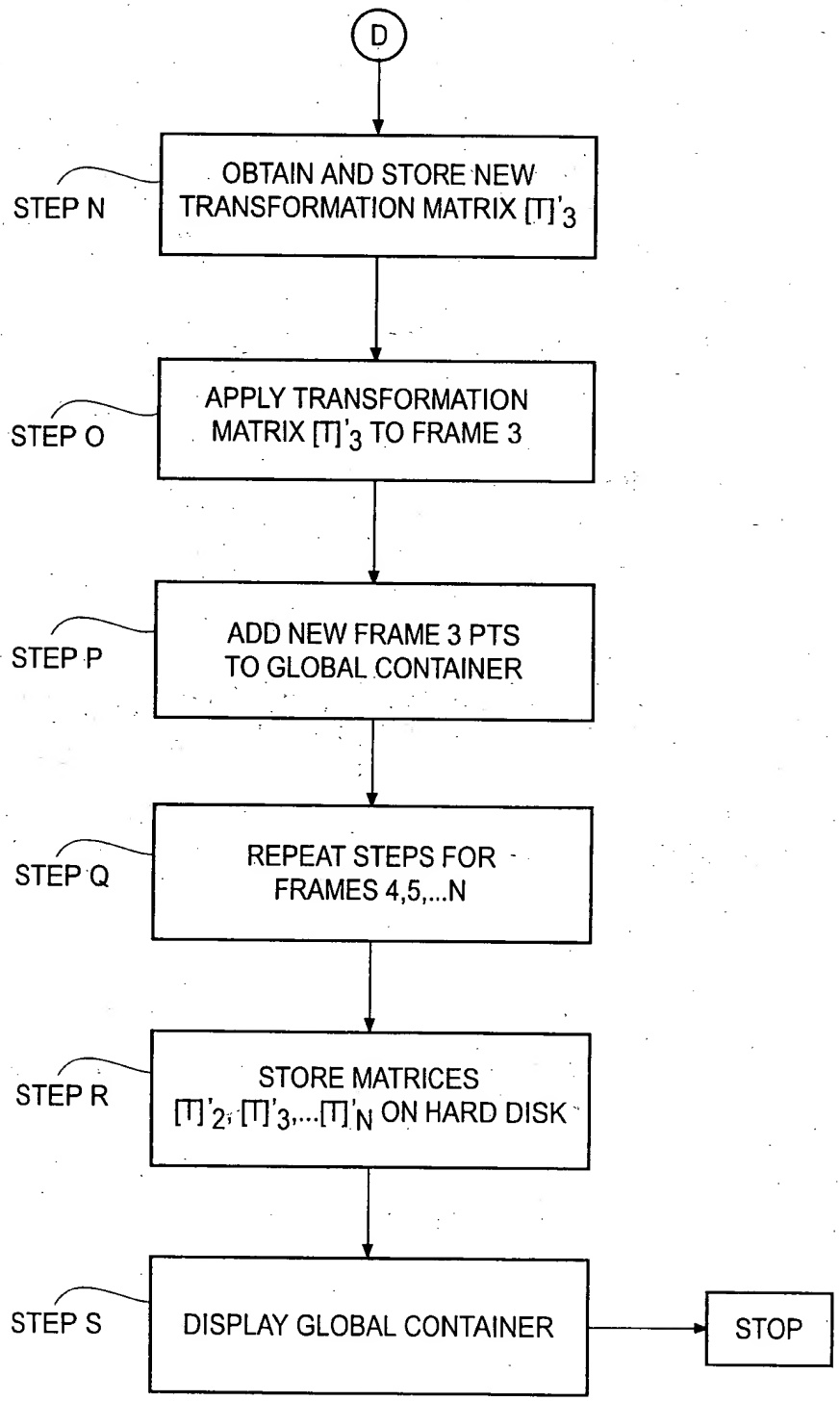

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FIG. 49

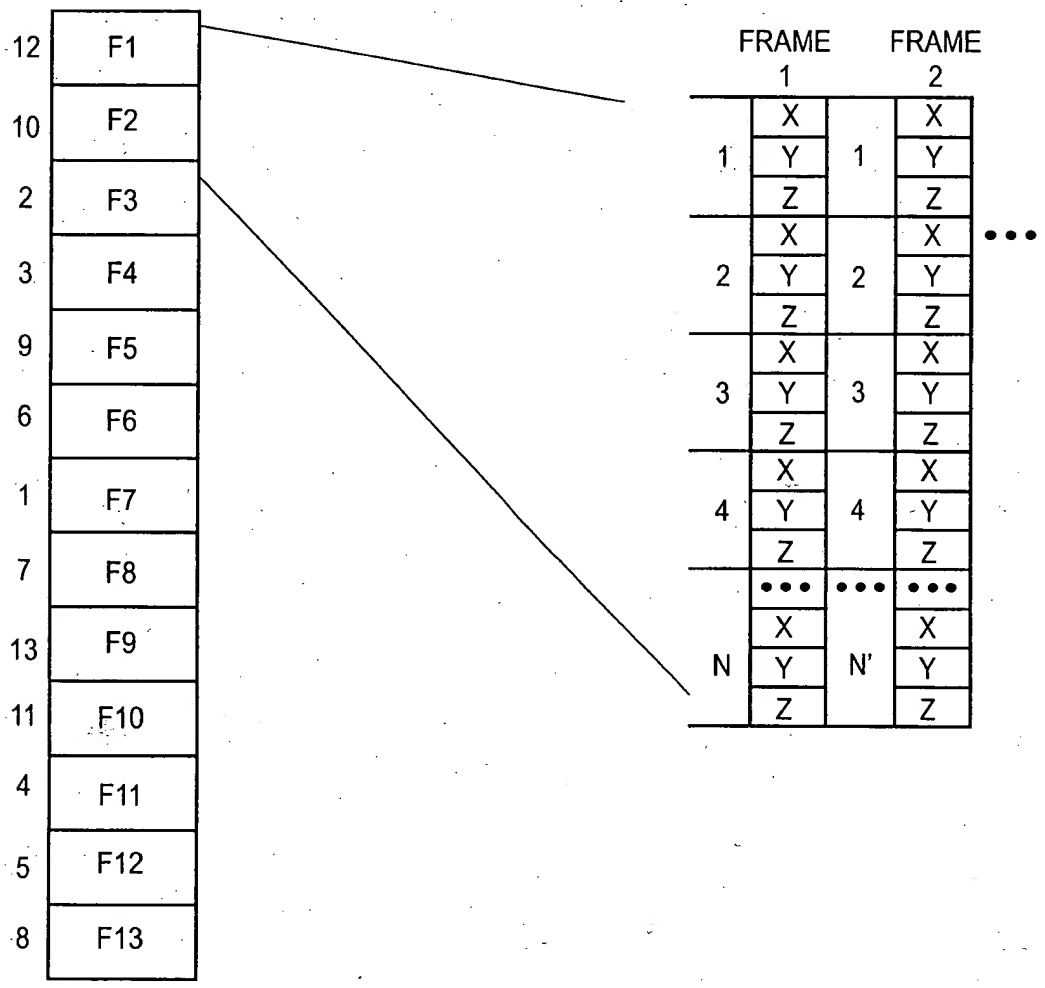

FIG. 50

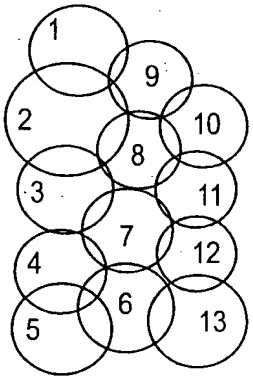

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FIG. 51

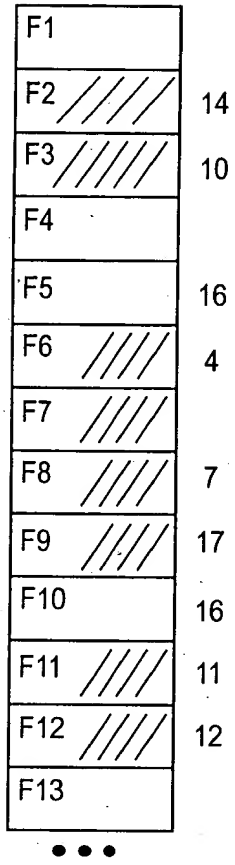

FIG. 52

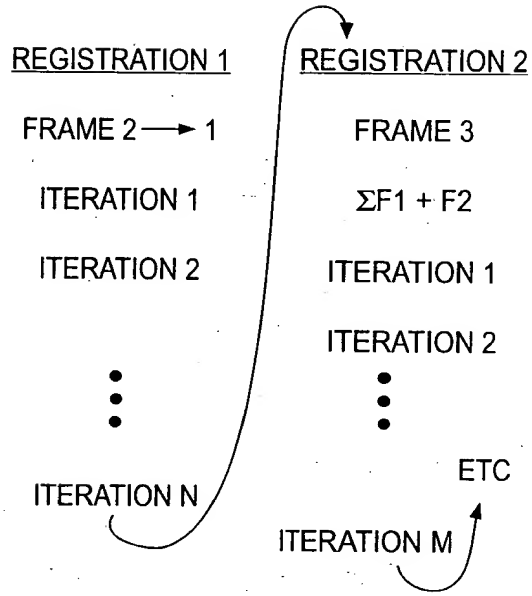

FIG. 53

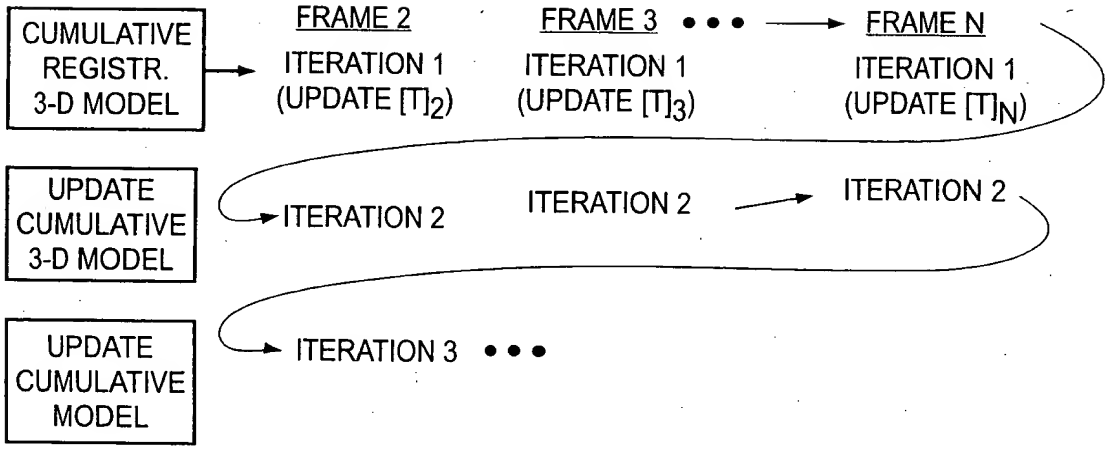

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FIG. 54

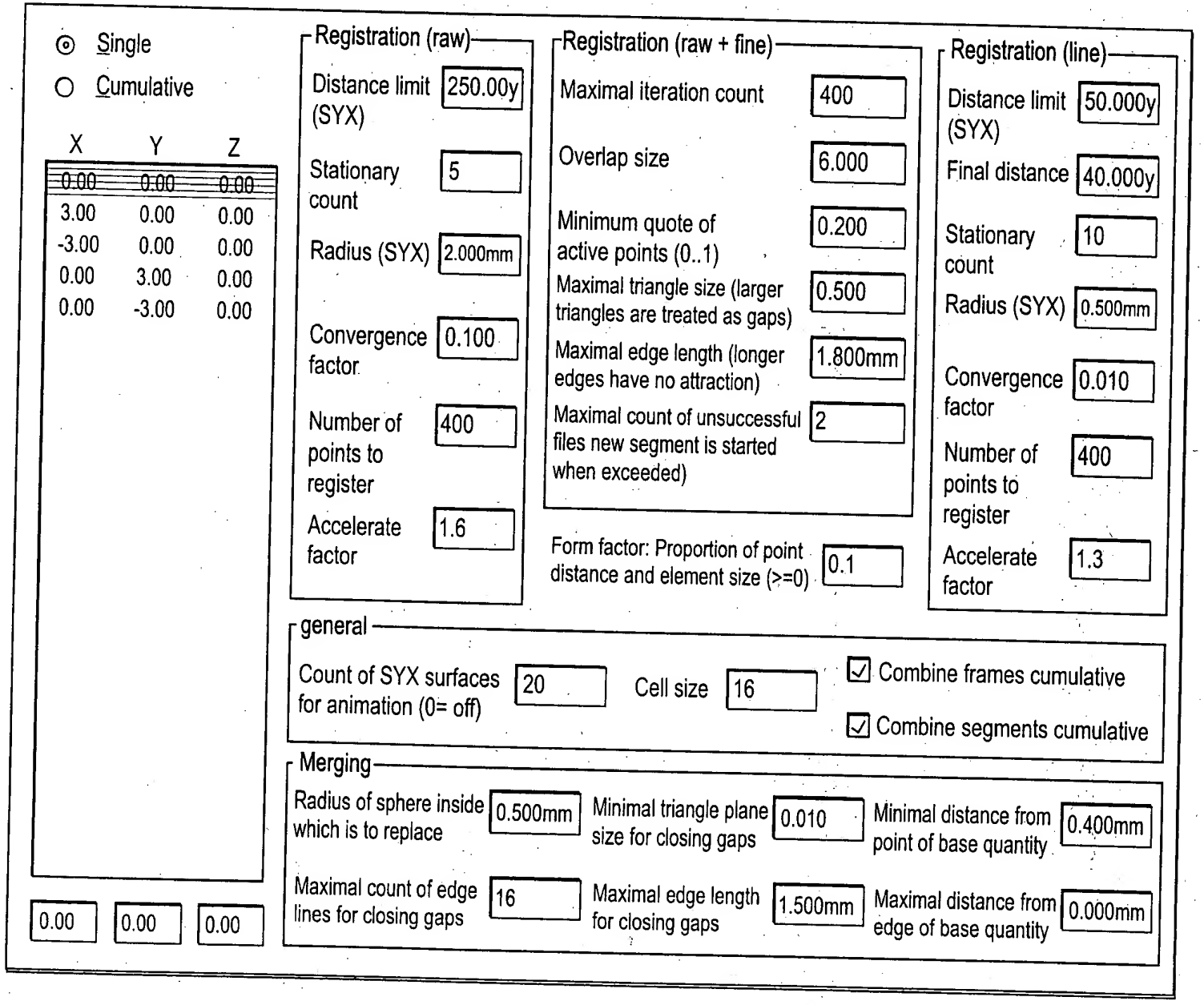

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FIG. 55

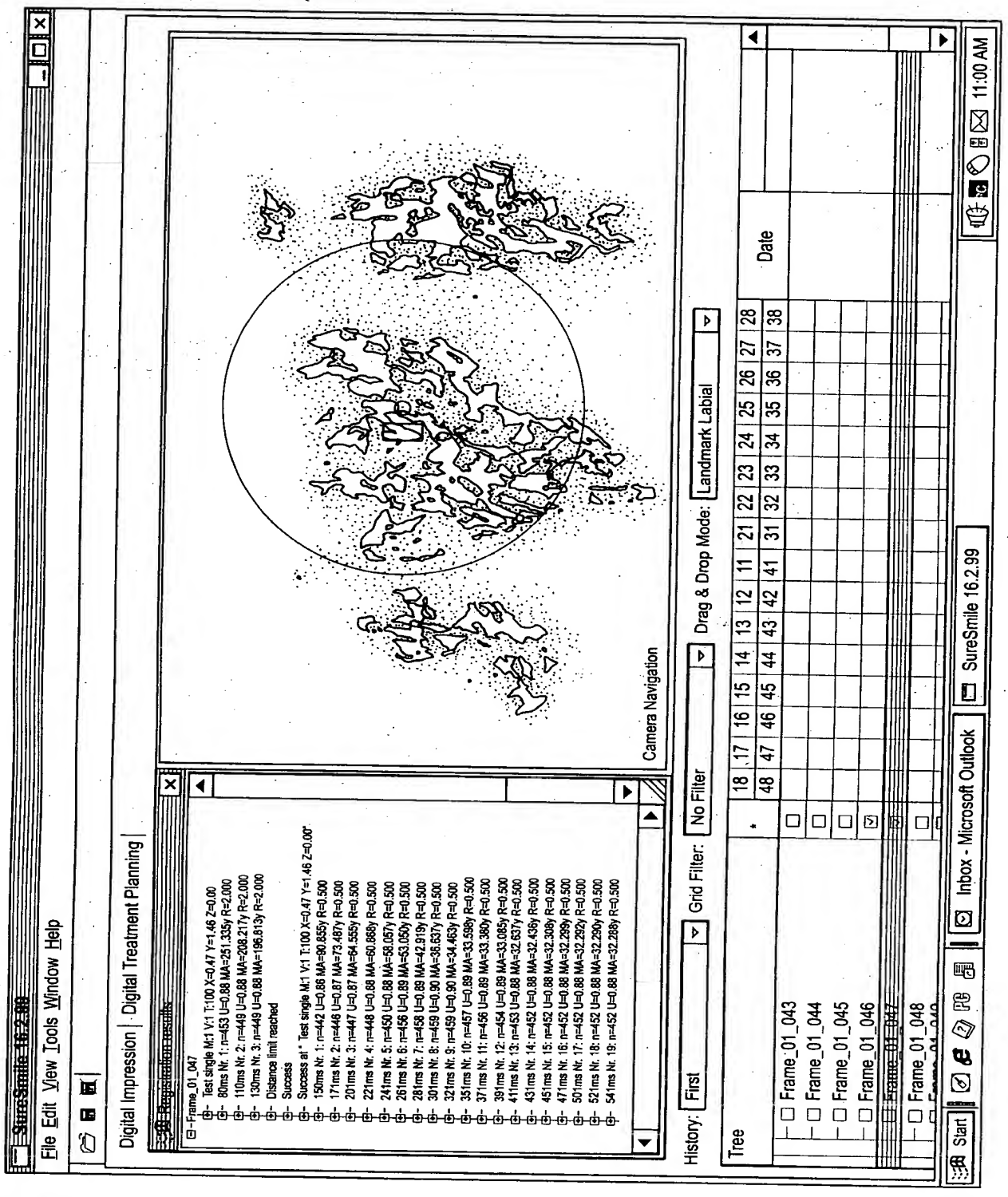

FIG. 56

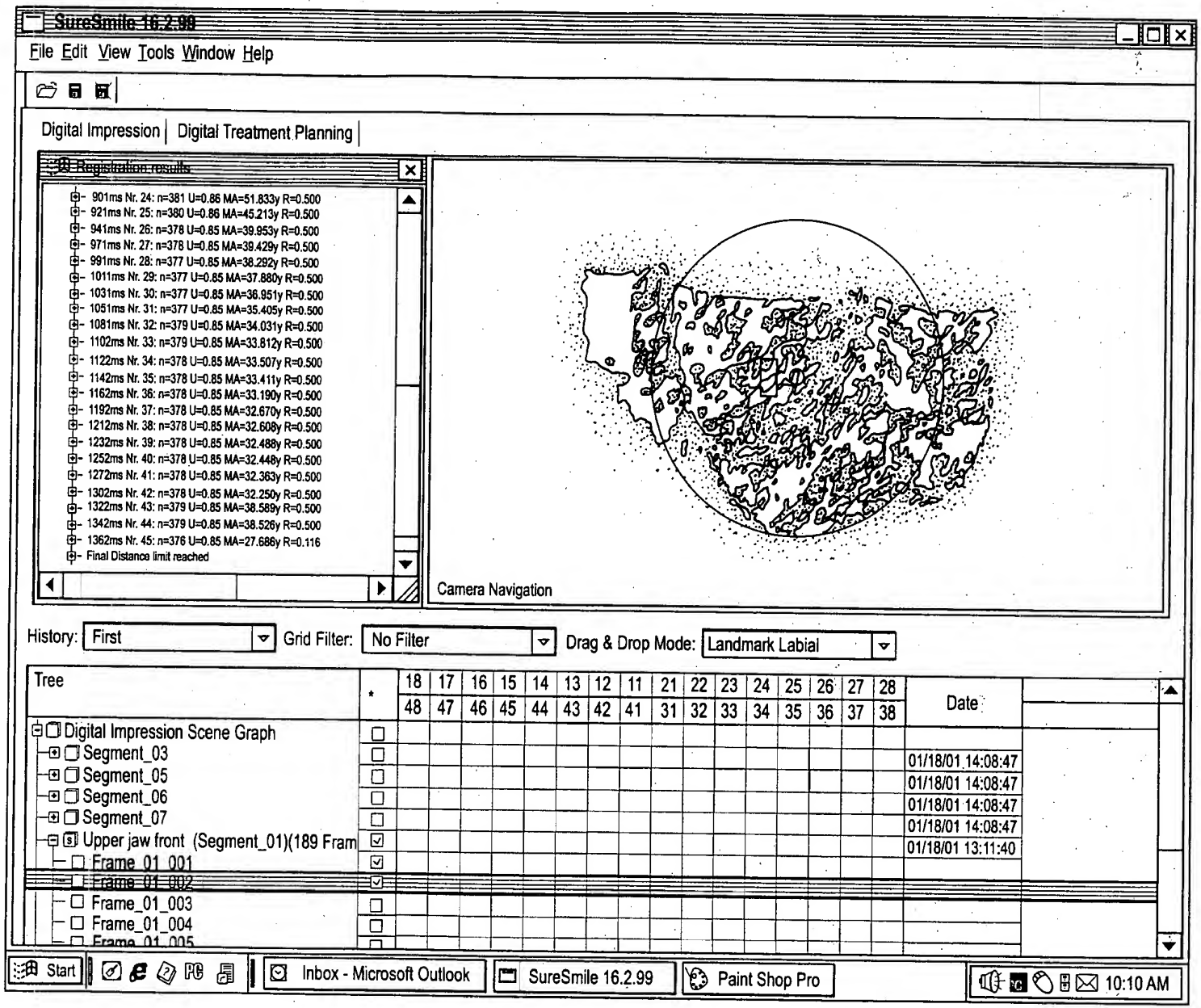

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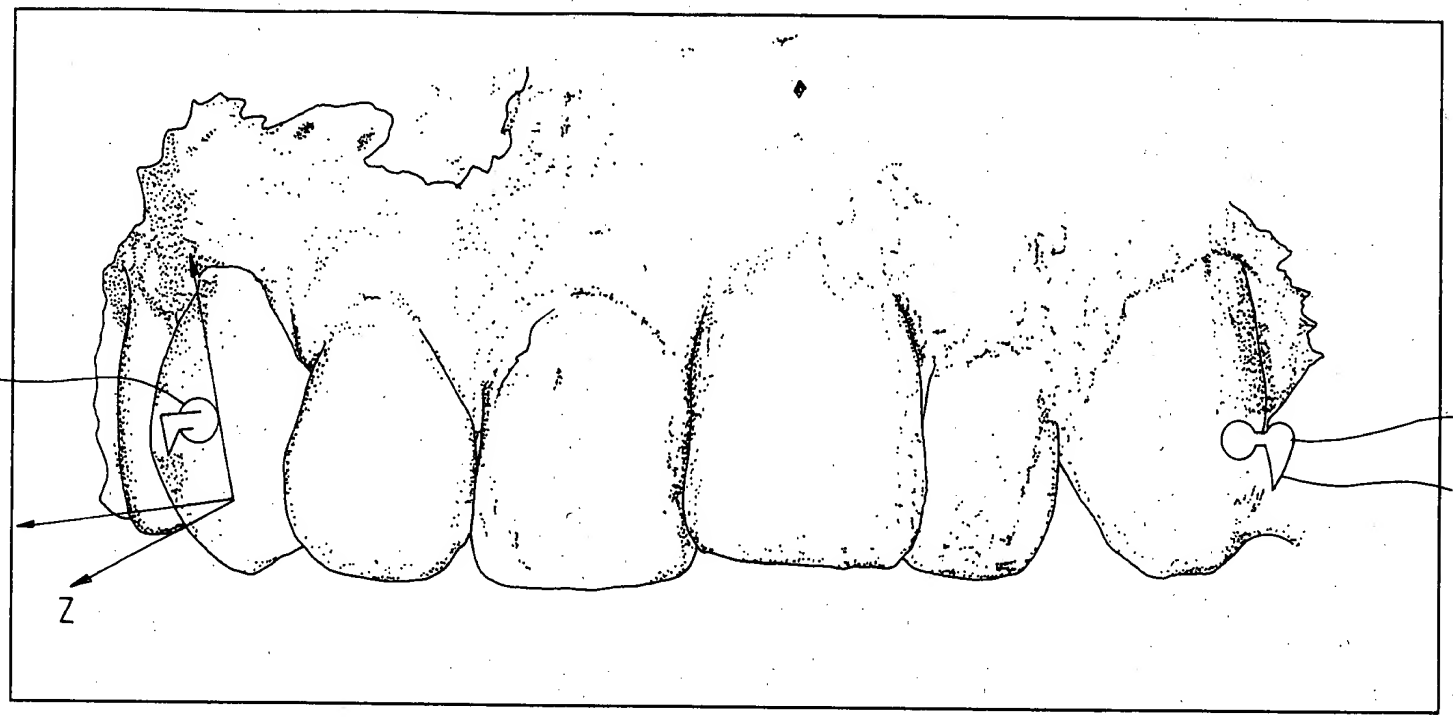
FIG. 57



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LANDMARK LABEL

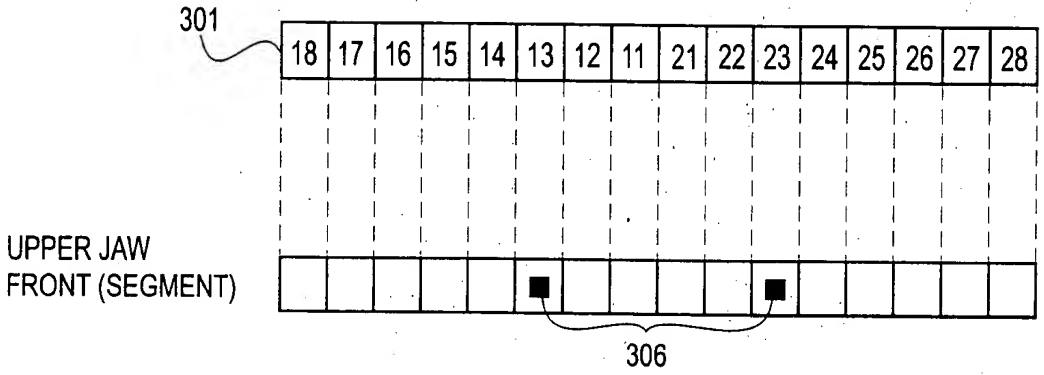

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Fig. 58A

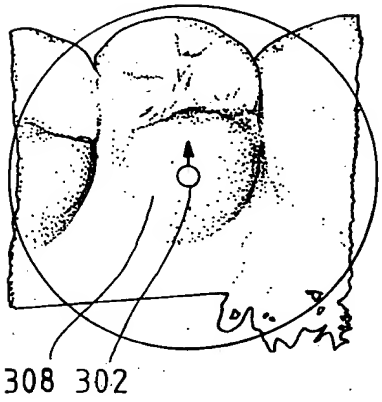

Fig. 58B

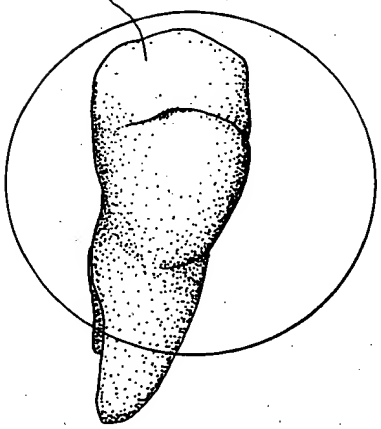

Fig. 58C

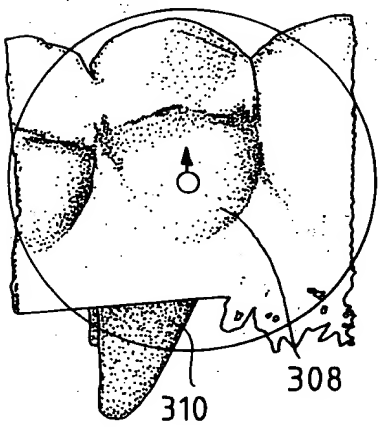

Fig. 58D

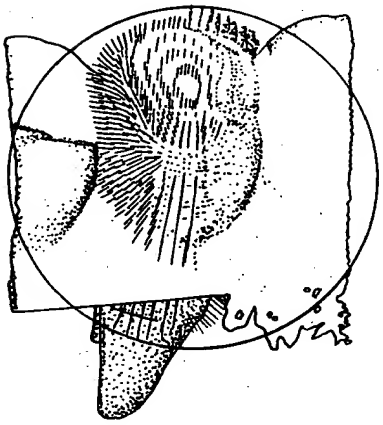

Fig. 58E

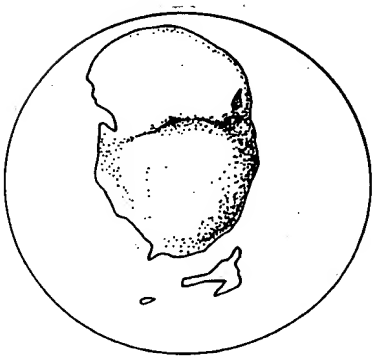

Fig. 58F

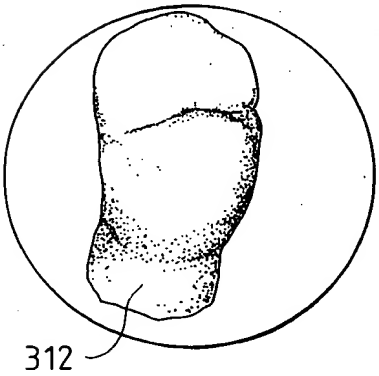

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Fig. 59

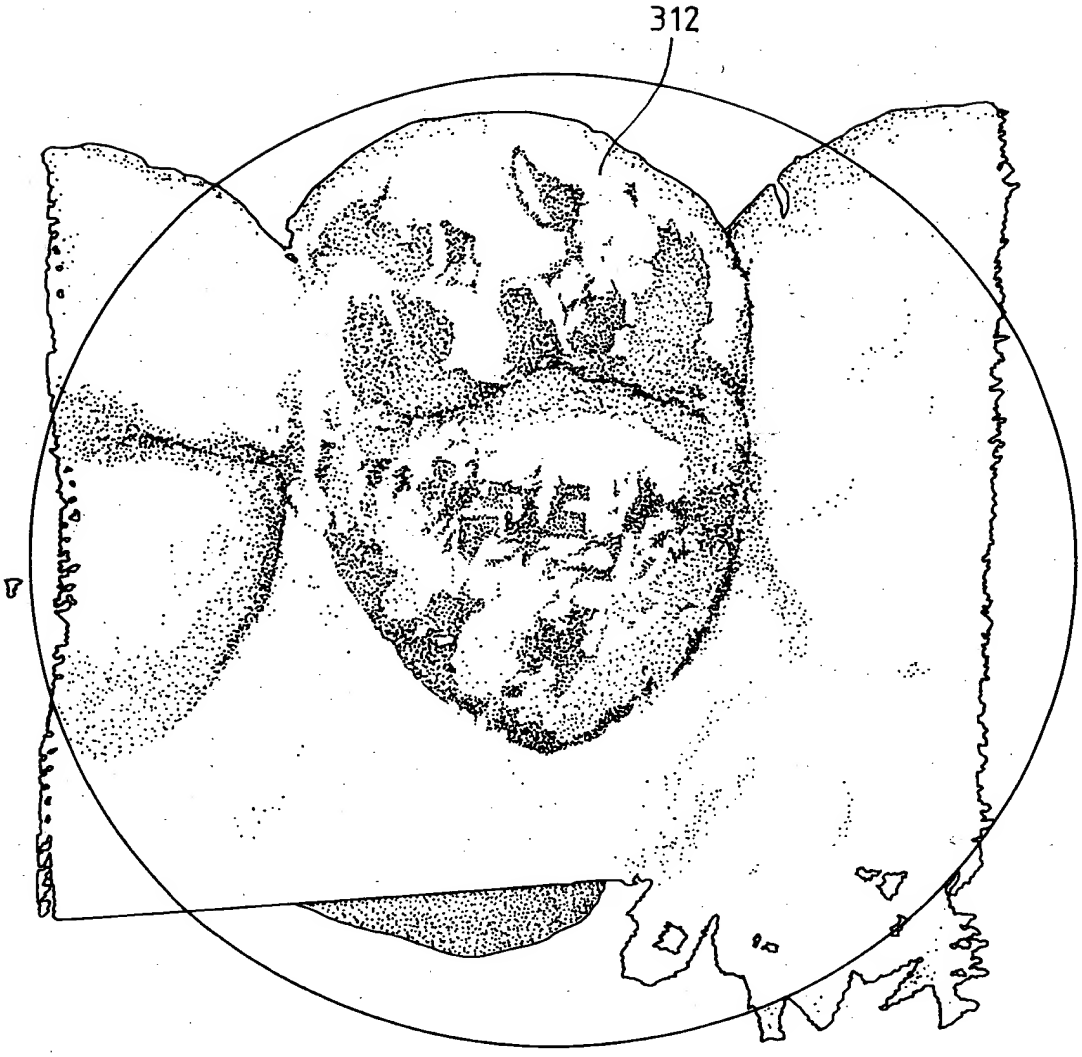

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FIG. 60

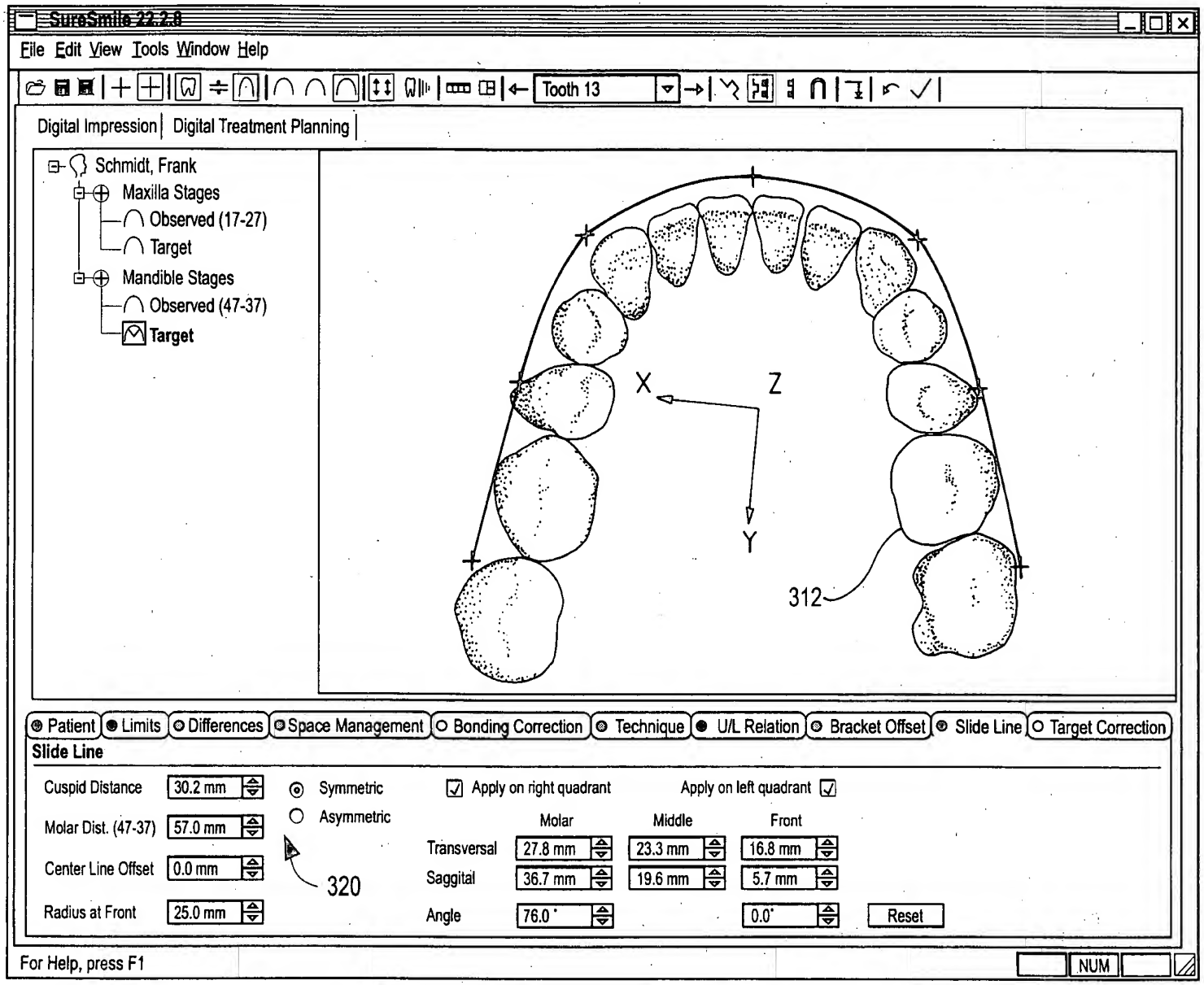

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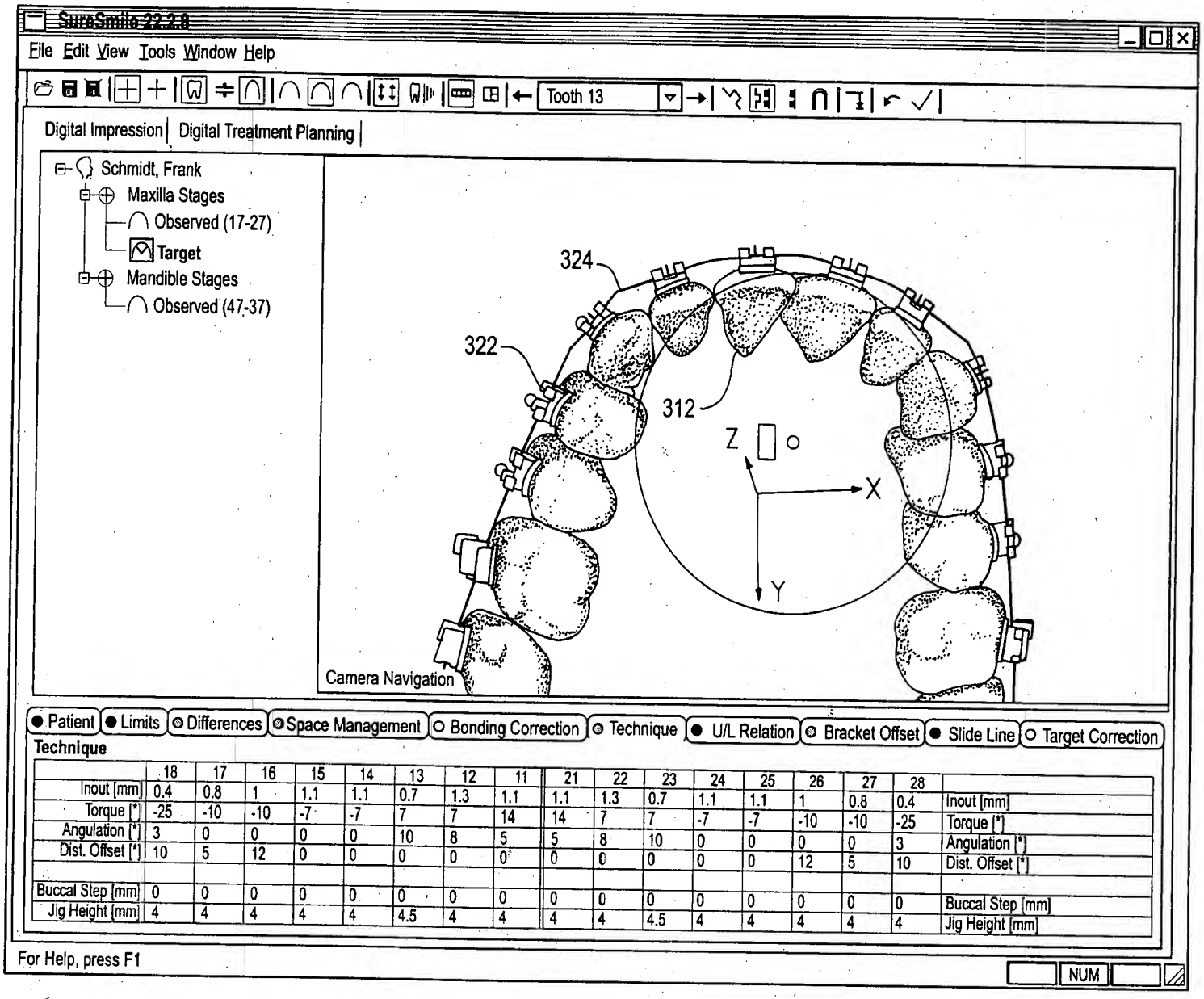
FIG. 61



	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	
Inout [mm]	0.4	0.8	1	1.1	1.1	0.7	1.3	1.1	1.1	1.3	0.7	1.1	1.1	1	0.8	0.4	Inout [mm]
Torque [°]	-25	-10	-10	-7	-7	7	7	14	14	7	7	-7	-7	-10	-10	-25	Torque [°]
Angulation [°]	3	0	0	0	0	10	8	5	5	8	10	0	0	0	0	3	Angulation [°]
Dist. Offset [°]	10	5	12	0	0	0	0	0	0	0	0	0	0	12	5	10	Dist. Offset [°]
Buccal Step [mm]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Buccal Step [mm]
Jig Height [mm]	4	4	4	4	4	4.5	4	4	4	4	4.5	4	4	4	4	4	Jig Height [mm]

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FIG. 62

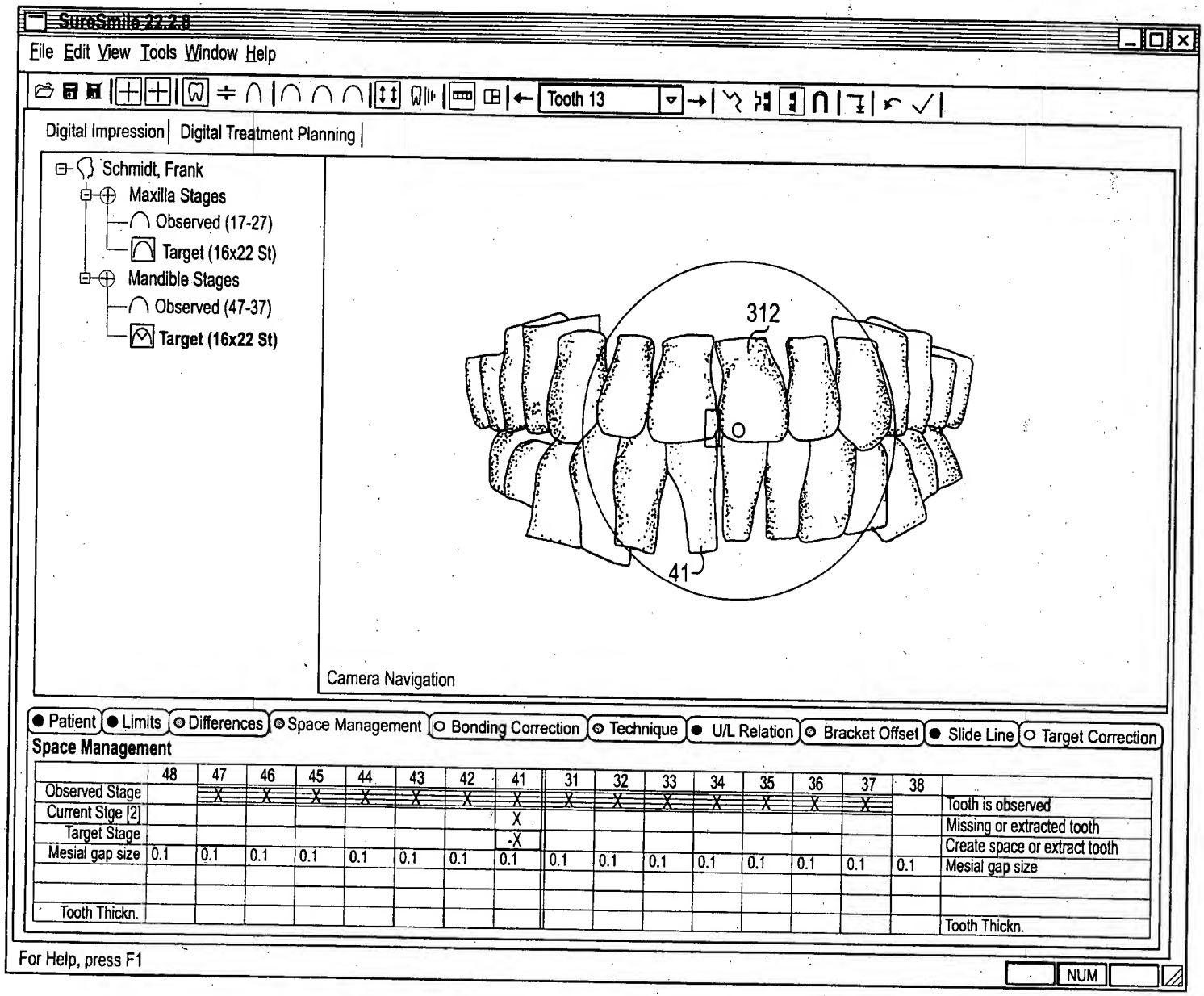

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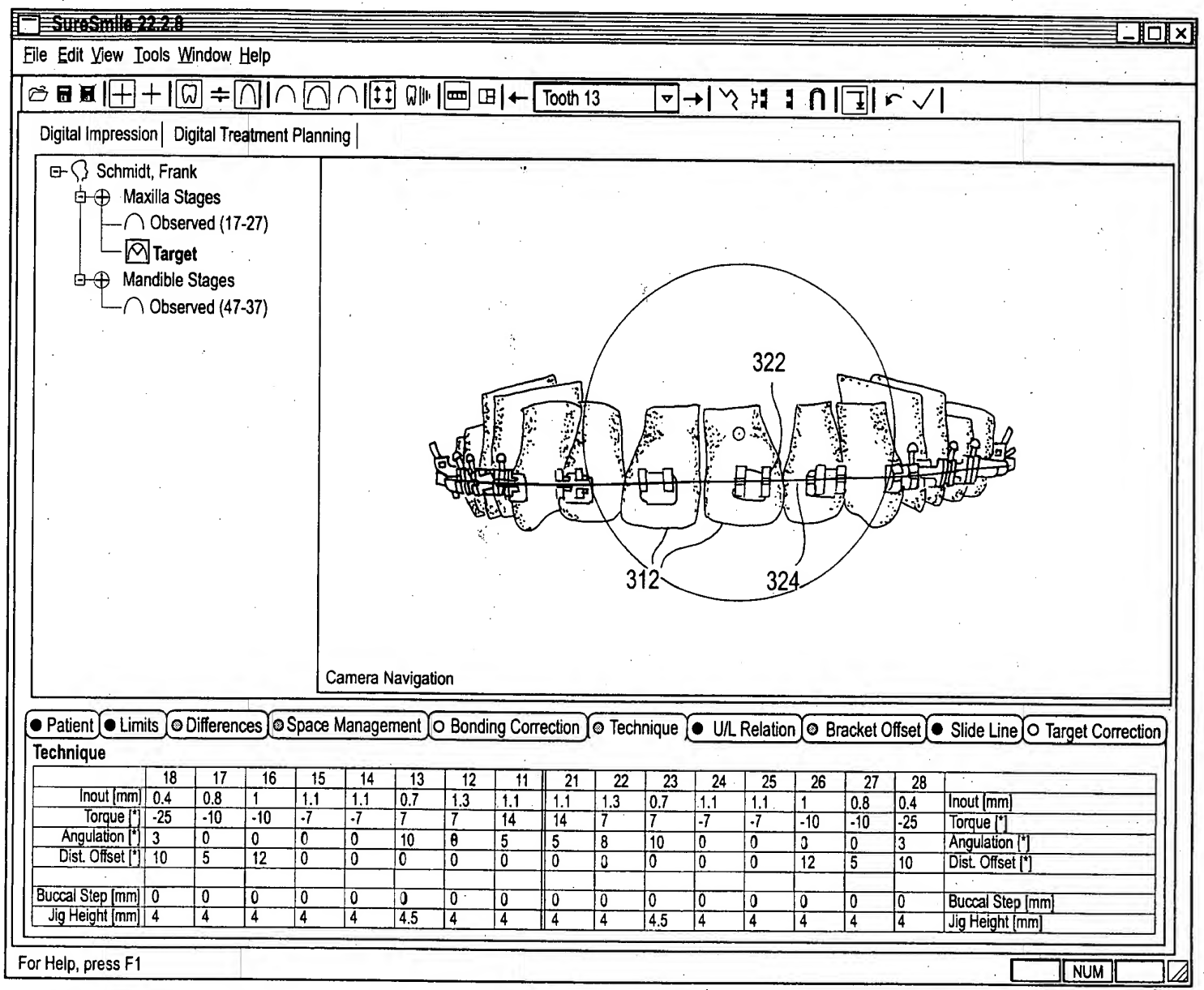
FIG. 63



	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	
Inout [mm]	0.4	0.8	1	1.1	1.1	0.7	1.3	1.1	1.1	1.3	0.7	1.1	1.1	1	0.8	0.4	Inout [mm]
Torque [*]	-25	-10	-10	-7	-7	7	7	14	14	7	7	-7	-7	-10	-10	-25	Torque [*]
Angulation [*]	3	0	0	0	0	10	0	5	5	8	10	0	0	0	0	3	Angulation [*]
Dist. Offset [*]	10	5	12	0	0	0	0	0	0	0	0	0	0	12	5	10	Dist. Offset [*]
Buccal Step [mm]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Buccal Step [mm]
Jig Height [mm]	4	4	4	4	4	4.5	4	4	4	4	4.5	4	4	4	4	4	Jig Height [mm]

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Fig. 64A

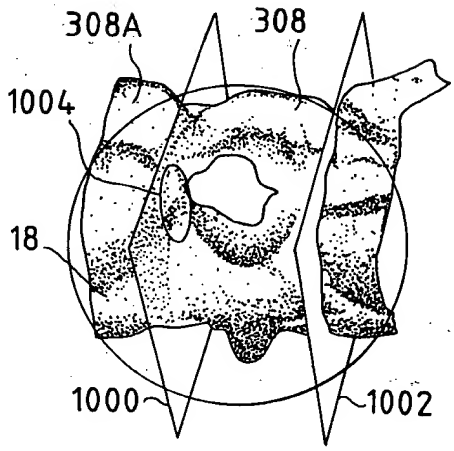

Fig. 64B

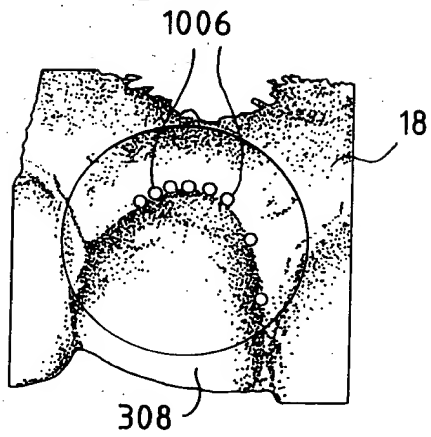

Fig. 64C

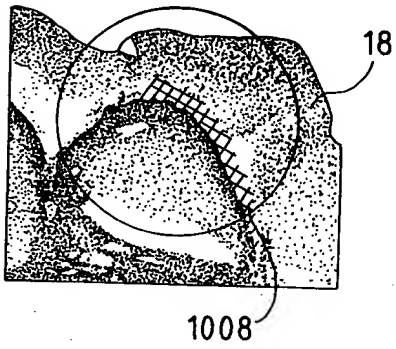

Fig. 64D

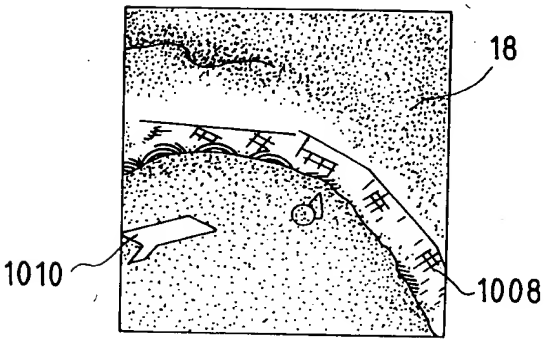

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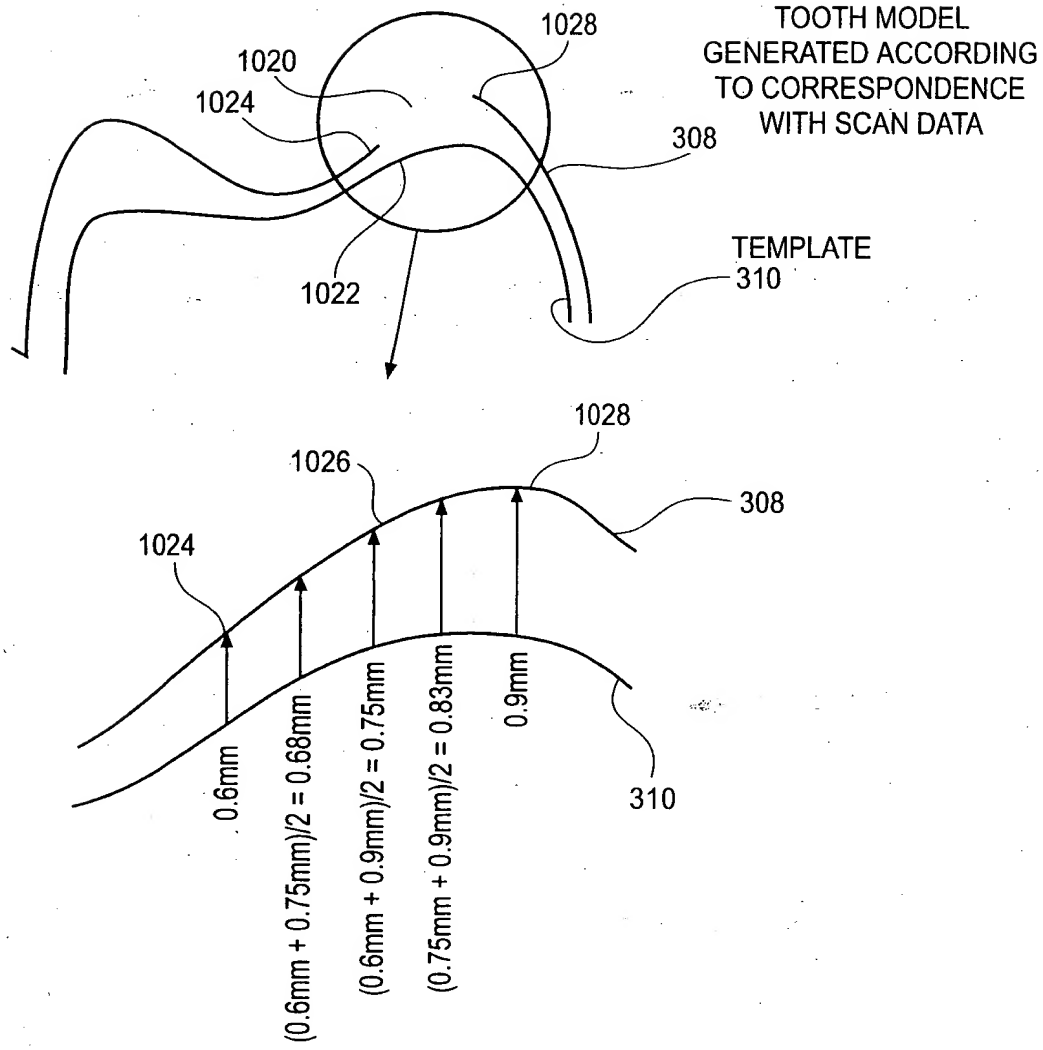
FIG. 65



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